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3



Rheumatic Diseases

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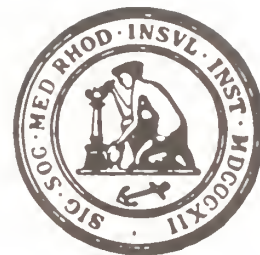
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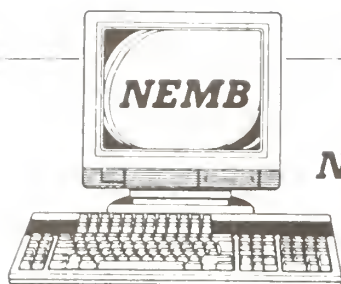
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The Many Names of Joint Disease

Few medical specialties are blessed—or burdened—with rheumatology's variety of names. At different times during the past century, this discipline has been called the study of rheumatism, joint diseases, arthritis and allied disorders, musculoskeletal disorders, and most recently, rheumatology, a recycling of an older term.

Rheumatology is derived from the Latin *rheuma* (which, in turn, comes from a similar Greek word) meaning a drip, a flow or a stream; in 16th century terms, it signified a morbid defluxion of mucous matter. The deeper meaning of a mucous nasal discharge could only then be appreciated by first accepting the fundamental humoral postulate that all natural disease was explainable by a disbalance of one or more of the four humors. Rheum, then, became a synonym for mucous discharge, so that Shakespeare's audience would readily understand when Shylock states in bitterness, "You that did void your rheum upon my beard . . ."

Rheumy came to mean the essence of drippiness and was exemplified by the congested, red-eyed, teary, patient with coryza (the latter, derived from a Greek word meaning catarrh or thick scum), the sort of patient who currently advertises antihistaminics on television. The word also connoted a moist, miasmatic quality of night air. Portia, in Julius Caesar, inquires of Brutus' health, stating: "And will he steal out of his wholesome bed to tempt the rheumy and unpurged air, to add to his sickness?" The 17th century also spoke of the rheums of age, the running eyes and dripping noses of the frail elderly. Poetically, the word indicated, variously, a phlegmatism (meaning sluggishness or apathy) and at times mere tears, as when Coleridge says: "Stoic eyes with foolish rheum o'erflowed."

Joint, from the Latin *junctum*, meant the place where two (or more) things are fitted

together. This junction could be either rigid (as in a plumbing joint) or flexible (as in a normal knee). From classical and medieval times a *junctum*—or its English derivative, joint—signified primarily the normal articulation of bones. The early orthopedic phrase for dislocation, out of joint, became a metaphor for things perverse or disorganized, as when Hamlet says, "Time is out of joint."

Articulation, which currently has many meanings, had evolved from the Latin, *artus*, meaning a joint. Its diminutive form, *articulus*, became the English words, article and articulation. When articulation refers to utterances it signifies distinct, separable, intelligible elements of speech, as opposed to uninterrupted growls or shrieks, which are said to be inarticulate noises.

Arthritis is descended directly from the Greek word, *arthron*, which is also the precursor of the Latin, *artus*. Arthritis, historically, has always meant an inflammation of one or more joints but was particularly used for that form of joint disease now called gout. Gout, in turn, is from the Latin *gutta*, meaning a drop, a defluxion. By the 15th century gout came to convey "a dropping of morbid material from the blood into and around the joints." But before that, gout had a less precise meaning and was used to define such diverse entities as migraine and diarrhea. An older term for cataract, *gutta opaca*, conveys the same sense of morbid drops. In prescription writing *gtt* (to mean the fluid measure, drops) is still used by older physicians.

The adjective, rheumatic, conveyed a broader meaning than rheum, and suggested systemic disease. This is seen even in Shakespeare where Titania observes: "The moon . . . washes all the air that rheumatic diseases do abound." By the 19th century, rheumatic processes intimated inflammation leading to fluid accumulation in joints and, perhaps, internal organs as well.

These systemic ramifications of rheumatism were clearly appreciated by some, even in the 16th century. Baillou, for exam-

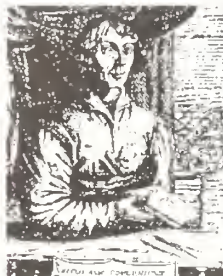
ple, says: "The method whereby this affliction attacks is falsely called catarrhal, which implies a distillation of humours flowing down from the head. It seems better to speak of it as Rheumatism. . . and although arthritis occurs in a single part, rheumatism invades the whole body with pain, swellings and a sense of heat." Baillie, in 1788, states: "The causes which produce a morbid growth of the heart are but little known, one of them would seem to be rheumatism attacking this organ." Jenner, better remembered for his advocacy of vaccination, had delivered a lecture in 1789 on cardiac disease associated with rheumatism (and illustrated by dissection). And Jean Batiste Bouillaud, combining poetic license with pathophysiological insight, stated: "Rheumatism licks the joints, the pleura and meninges, but bites the heart."

Stanley M. Aronson, MD

Nicolaus Copernicus: Star-struck Physician

"But in the midst of all dwells the sun. For who, in this most beautiful temple, could place this lamp in another or better place than that from which it can at the same time illuminate the whole? . . . So indeed the sun, sitting on the royal throne, steers the revolving family of stars."

This passage from *De Revolutionibus Orbium Coelestium* (1543), written by an elderly church canon in northern Poland, was but one of his many observations incorporated into a text that succeeded in confronting, and then displacing, the comfortable geocentric theories of the cosmos



previously advocated by virtually all scholars and clerics from Aristotle through Ptolemy. What manner of man was the author of this seminal volume?



Born in 1473, Copernicus had been named after his father, Nicolaus Koppernigk, a rich metals merchant and magistrate in the Polish city of Torun on the Vistula river. The family name was probably derived from a town of that name in upper Silesia noted for the mining and processing of copper. The father died when the younger Nicolaus was 10, at which time his supervision was assumed by his maternal uncle, Lucas Waezenrode, Bishop of Ermland on the Gulf of Danzig. Nicolaus was sent to the great university of

K r a k o w where he studied mathematics (Latinizing his family name to Copernicus, as was then customary with university students). At the age of 23 he travelled south to Bologna for a 3-year interval to study canon law, thus preparing him for a career in church administration. He then returned to the northern Polish town of Frauenberg where in 1497 he was chosen by his uncle to be canon of the cathedral. For the remainder of his life Copernicus remained an integral part of the Roman Catholic church although he never took priestly orders.

In 1501 he undertook a leave of absence and again crossed the Alps to resume his studies in northern Italy, first completing his church law studies at Ferrara and then, with his uncle's blessing, embarking upon comprehensive medical studies at the university in Padua. In 1505 he returned to his uncle's bishopric in Heilsberg where he was appointed as the diocesan physician. For the remainder of Copernicus' life he practiced medicine, officially serving a succession of bishops as well as bestowing his healing arts upon the inhabitants of the neighboring communities. His local fame, during his lifetime, rested dually upon his diligence as a church administrator and on his medical skills within the Frauenberg township. Little local attention was paid to his avocation as a stargazer or recorder of cosmic body movements.

The writings of Copernicus, in contrast to his contemporary Leonardo da Vinci, were sparse. A translation from Greek to Latin of the epistles of Theophylactus represented the first of four published texts that bear his authorship. The second treatise was a commentary advocating monetary reforms for the city of Graudenz (*De monetarum cudentae ratione*); and the third was a preliminary discussion of the concept of heliocen-

tricity, published in his name by a disciple, Rheticus, as *Narratio prima de libris Revolutionum* (1530). Rheticus, incidentally, was a 25-year-old mathematics scholar from the Lutheran city of Wittenberg who visited Frauenberg after learning of Copernicus' lengthy but disorganized manuscript expressing dissent with the Ptolemaic doctrines of geocentricity. Rheticus, born George Joachim, had changed his name following the beheading of his father, an eminent German physician, who had been executed for engaging in certain unorthodox, "sorcerous," therapies. It was Rheticus who finally collated the fragments of *De Revolutionibus* assembling it into a 200-page text of six books. This remarkable treatise, Copernicus' fourth publication, was first published in Nuremberg in 1543. In late 1542, Copernicus had suffered a series of apoplectic strokes rendering him paralyzed and aphasic. Two days before his death on May 24, 1543, a printed copy of his monumental text was placed in his hands but it is doubtful that he grasped either the personal or historic significance of the volume.

There is no record to indicate that Copernicus ever wrote or published anything of a medical (or theological) nature. In his older years, his medical practice had enlarged appreciably, and there is reference to his healing skills in the 16th century records of the town of Frauenberg. Indeed, the town archives refer to him as the Polish Aesculapius. He is buried in the Frauenberg cathedral.

Copernicus lived within and contributed to an era marked by the rebirth of imaginative, courageous and creative thinking. His was a faith tempered by reality; his beliefs concerning new scientific proposals rested upon two principles: first, they had to be consistent with established observation; and second, they had to be in harmony with the accepted axioms of physics. He contended, moreover, that there could be a tyranny of the mind when innocent observations were taken in isolation. Certainly, for example, common sense and the knowledge gathered by the eye could plainly see that it was the sun and all other celestial bodies that rotated about the clearly stationary earth—and not the other way around. Was it his medical training, as some biographers have speculated, that allowed Copernicus to confront the patent evidence of the naked eye, evidence sustained by the weight of contemporary authority and the esteem of past beliefs?

He was part of a generation of great maritime explorers and scientists seeking to understand the rules of earthly and celestial mechanics. Copernicus distilled his new

NICOLAI COPER

NICI REVOLVTIONVM

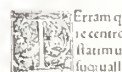
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Quod mundus sit sphaericus. Cap. i.



PRINCIPIO aduertendum nobis est, quod huiusmodi esse mundum, siue quod ipsa forma perfectissima sit omnium, nulla indigens compagine, tota integra: siue quod ipsa capacissima sit figurarum, quae compositae sunt omnium, & conformatur maxime deae: siue etiam quod absolutissime quaeque mundi partes, Solem dico, I. unam & sicillas, tali forma conspicantur: siue quod hac uniuersa appetat terminari, quod in aquae guttis ceterisque liquidis corporibus apparet, dum per se terminari cupiunt. Quo minus talis formae calculis corporibus attributam quicquam dubitauerit.

Quod terra quoque sphaerica sit. Cap. ii.



ERRAM quoque globolum esse, quoniam ab omni parte centro suo innititur. Tamen si absolutus orbis non situm uidetur, in tanta montium excellantia, delentur, siue quod altum, quae tamen uniuersam terrae rotunditatem minime euariant. Quod ita manifestum est. Nam ad Septentrionem unumquodque committuntur, uertex ille diurnae revolutionis paulatim attollitur, altero tantumdem ex aduerso subeunt, pluresque sic illae circum Septentriones uidentur non occidere, & in Austro quaedam amplius non oriri. Ita Canopum non ceruicula, & gyrio patetem, Et Italia postremam flammam stellam uidet, quam regio nostra plaga rigentioris ignorat. E contra, in Austrum transcurrentibus attolluntur illa, residuisque, quae nobis excelsa sunt. Interca & scriptis polorum inclinationes ad euentum terrarum spacia eandem ubique rationem habent, quod

beliefs from three decades of personal observations unaided by the telescope (an instrument that would require another seven decades before its invention). From his apartment perched upon the high cathedral wall, he devised his innovative cosmologic scheme unaided by reference libraries, technical assistants or grants. Although contradicting assertions made in the Bible, his astronomic data were nevertheless studied with care by the Church because they provided a more rational basis for the ongoing calendar reforms that culminated in the Gregorian schedule of 1582. In Boorstin's words, "The Church had survived many a secular novelty. Wiser heads continued to hope that the eternal truths of revelation and divine reason could be kept safely isolated from the shifting explanations of the practical world."

Copernicus, practicing physician, opened a door permitting Kepler, Galileo and a host of gifted astronomers to enter into a newer cosmology that replaced the more comfortable and less terrifying doctrines of the primitive Ptolemaic system.

In mourning the passing of this static, stable and unchanging geocentric structure, Donne had said: "'Tis all in pieces, all coherence gone." Copernicus was party to that most recurrent of calamities disquieting the sciences: the destruction of an elegant hypothesis by a dreary fact. He persevered in the notion that the world is comprehended by continuous observation not by doctrine.

A fundamental question of renaissance 16th century continued to be: The cosmos, is it finite or infinite? Copernicus' answer was—Yes.

Stanley M. Aronson, MD

Bacterial Endocarditis and Septic Arthritis Presenting as Polymyalgia Rheumatica

Amy Spomer, MD
George Ho, Jr., MD

Bacterial endocarditis can present with a variety of musculoskeletal symptoms such as arthralgia, myalgia, arthritis, and back pain. About a third of all cases of bacterial endocarditis have some form of rheumatic manifestation.¹⁻³ In one series of 192 patients with endocarditis, musculoskeletal complaints were the first symptoms of bacterial endocarditis in 29 patients (15%).¹ The following case is an example of bacterial endocarditis presenting as polymyalgia rheumatica and septic arthritis.

Case Report

SG, a 74-year-old white woman, was admitted to the hospital with a 1-week history of worsening myalgia, arthralgia, and weakness. The pain was located in her left leg, shoulders and neck, and had progressed to the point where she could not walk or move her limbs without severe pain. She had walked 3 miles per day before the abrupt onset of this illness. There was a history of hypercholesterolemia and lovastatin (Mevacor) was recently changed to gemfibrozil (Lopid). However, she mistook the lovastatin for her arthritis medication, diclofenac (Voltaren). Thus, she was taking both lipid-lowering drugs concurrently. She denied having fevers, chills, chest pain, or shortness of breath. Other significant history included osteoarthritis and a porcine valve replacement in 1986 for aortic stenosis.

Physical examination revealed a temperature of 37.6°C, pulse rate of 76 beats per minute, respirations were 26 per minute, and blood pressure of 108 mm Hg over 42 mm Hg. Significant physical findings included a grade 2/6 systolic ejection murmur at the left sternal border without radiation;

bony enlargement of DIP and PIP joints of her hands consistent with osteoarthritis; a warm, painful left knee with a moderate effusion; and proximal muscle tenderness and weakness in the hip and shoulder girdles.

Initial laboratory studies included a normochromic normocytic anemia with a hemoglobin of 9.5 g% and hematocrit of 28.3%; 13,900 white blood cells per ml with 58% polymorphonuclear cells, 36% bands, 2% lymphocytes, and 4% mononuclear cells; an erythrocyte sedimentation rate (ESR) of 120 mm/hr; a creatine phosphokinase (CPK) of 22 IU, (normal range of 5-172 IU); and non-reactive antinuclear antibody and rheumatoid factor.

Thirty millimeters of cloudy fluid was aspirated from the left knee. The fluid contained 16,000 red blood cells per ml and 24,000 white blood cells per ml with 90% polymorphonuclear leukocytes. The glucose level was 119 mg% with a simultaneous serum glucose level of 147 mg%. No crystals or bacteria were seen. The synovial fluid was cultured and blood cultures were drawn.

The initial differential diagnosis focused on the myopathy that can result from the concurrent administration of lovastatin and gemfibrozil. But drug-induced muscle damage became unlikely when the CPK level was found to be within the normal range. Polymyalgia rheumatica was then considered because of the diffuse symptoms and the finding of tenderness in the proximal muscle groups in association with the markedly elevated ESR. The patient was started on 10 mg of prednisone per day.

Over the next 2 days, she showed only minimal improvement. On the fourth hospital day, both the synovial fluid and the blood cultures were positive for enterococcus. Prednisone was discontinued and intravenous penicillin and gentamicin were begun. Within the next week, her musculoskeletal symptoms totally resolved. Four days after the initiation of antibiotic treatment, a repeat culture of synovial fluid from the left knee was sterile.

An echocardiogram showed concentric left ventricular hypertrophy with moderate left atrial enlargement. The prosthetic aor-

One or more rheumatic complaints were found in one-third of 480 cases of bacterial endocarditis examined in three studies.

tic valve was well seated without evidence of vegetations. Roentgenograms of the left knee revealed advanced osteoarthritis. No obvious source of the enterococcal infection was found. The patient completed 4 weeks of antibiotic treatment and was discharged home.

Discussion

Enterococcus is an important pathogen in cholangitis, cholecystitis, endocarditis, and intra-abdominal and genitourinary infections. It is rarely a cause of septic arthritis.^{4,5} Table 1 summarizes the information on six reported cases of septic arthritis caused by enterococcus. The spectrum of enterococcal arthritis encompasses patients of all ages with normal, diseased, or prosthetic joint. The outcome of treatment is often poor.

A review of 153 cases of enterococcal bacteremia revealed 13 cases of endocarditis (8.5%).⁶ Enterococcal endocarditis is typically a subacute illness that affects the elderly with preexistent valvular heart disease. The indolent infection often originates from the genitourinary tract and is usually community-acquired. Conversely, when enterococcal bacteremia is nosocomially acquired or cultured with another bacterium (ie, polymicrobial bacteremia), it is a fulminant illness with high mortality, but endocarditis is rarely present.⁶ Our patient's illness was characterized by enterococcal bacteremia acquired before hospitalization, a heart murmur in the setting of a prosthetic porcine aortic valve, and an extracardiac site of infection, the left knee with underlying osteoarthritis. Both endocarditis and septic arthritis have resulted from enterococcal bacteremia without an obvious source.

Endocarditis presenting as septic arthritis has been reported.⁷⁻⁹ The causative agents have been Gram-positive cocci including

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ABBREVIATION USED

CPK: Creatine phosphokinase
DIP: Distal interphalangeal (joints)
ESR: Erythrocyte sedimentation rate
PIP: Proximal interphalangeal (joints)
WBC: White blood cells

group *B streptococcus*, non-group *D streptococcus*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Streptococcus suis*, *Streptococcus viridans*, and *Aerococcus viridans*. This report adds enterococcus to this list of microorganisms.

One or more rheumatic complaints were found in one-third of 480 cases of bacterial endocarditis in three studies examined (Table 2).¹⁻³ The myalgia and arthralgia in our patient centered on the shoulder and hip girdles, simulating the findings of polymyalgia rheumatica, and she was erroneously diagnosed and treated until the blood culture results became known. Two cases were similarly misdiagnosed as polymyalgia rheumatica in the series from the Mayo Clinic.¹ In the same series, a patient with streptococcal endocarditis had shoulder synovitis characterized by an inflammatory exudate consisting of 24,000 WBC per ml with 98% polymorphonuclear leukocytes, but it was sterile. Thus, frank arthritis that accompanies endocarditis is either a septic joint caused by the same microorganism, as in our patient, or a sterile inflammatory response presumably involving immune mechanisms.

Back pain is also a common complaint among patients with endocarditis and has been associated with vertebral osteomyelitis, disc space infection, disc herniation, sacroiliitis, and renal infarction or glomerulonephritis. The cause of the myalgia seen in endocarditis has been attributed to vasculitis or arterial embolization. The pathogenesis of these musculoskeletal symptoms remains poorly understood.

Treatment of enterococcal endocarditis requires the use of penicillin or ampicillin plus gentamicin for its synergistic effect.⁶ The duration of therapy is 4 to 6 weeks. Presence of symptoms for greater than 3 months or mitral valve involvement requires longer duration of therapy to reduce the risk of relapse. Monitoring bactericidal levels and testing for gentamicin resistance are recommended, especially if the infection appears refractory to treatment.

Summary

We describe a case of enterococcus endocarditis in a 74-year-old woman with hypercholesterolemia, porcine aortic valve, and osteoarthritis. She presented with the abrupt onset of severe back pain, proximal myalgia, and left knee synovitis, associated with an anemia and marked elevation of ESR. She was misdiagnosed as having polymyalgia rheumatica until both the syn-

Table 1.—Septic arthritis caused by enterococcus*					
Case	Age	Sex	Joints involved	Other significant factors	Outcome
1	71	M	right knee	alcohol excess, corticosteroid therapy	amputation because of osteomyelitis
2	61	M	left hip	rheumatoid arthritis prosthetic joint, corticosteroid therapy	removal of prosthesis & excision arthroplasty
3	6 weeks	F	right hip	Group B streptococcal osteomyelitis and septic shoulder	response to antibiotic and open drainage
4	46	M	polyarticular	trauma and mixed infection with non-hemolytic streptococcus	amputation of leg
5	62	M	right knee**	none	response to antibiotic treatment
6	73	F	left knee	osteoarthritis bacterial endocarditis	response to antibiotic treatment
* Cases 1 and 2 are reported in reference 4, cases 3 and 4 are referred to in reference 4, case 5 is reported in reference 5, and case 6 is the patient in this report.					
** Enterococcus was cultured from synovial tissue after the synovial fluid culture had been negative.					

Table 2.—Distribution of rheumatic manifestations of bacterial endocarditis			
Country	United States ¹	South Africa ²	France ³
Cases with rheumatic manifestations/total cases	84/192	50/180	32/108
Myalgia	27 (32%)	} 19 (38%)	5 (16%)
Arthralgia	32 (38%)		13 (41%)
Arthritis	26 (31%)		8 (25%)
Backache	24 (29%)	17 (34%)	13 (41%)

ovial fluid and blood cultures grew enterococcus. Her musculoskeletal symptoms totally resolved with antibiotic treatment. Septic arthritis is a rare manifestation of bacterial endocarditis. However, one-third of all cases of bacterial endocarditis have musculoskeletal symptoms. These include backache, arthritis of the peripheral joints, and diffuse myalgia and arthralgia. Unexplained rheumatic complaints should alert us to the possibility of bacterial endocarditis.

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Pseudoseptic Arthritis

George Ho, Jr., MD

Acute septic arthritis is a curable disease; yet the mortality rate of nongonococcal bacterial arthritis in adults remains at 10%.¹ The infection usually is monoarticular. The typical patient is elderly and has one or more underlying chronic diseases that predispose to infection. Many also have a preexisting joint disease such as osteoarthritis, rheumatoid arthritis, or gout. While comorbid states influence the mortality and morbidity, misdiagnosis and delay in treatment of septic arthritis contribute to the poor outcome of therapy.² However, the unwarranted continuation of antibiotic treatment against an acutely inflamed joint due to a noninfectious cause exposes the patient to the risk of drug toxicity.³

Table 1 presents the differential diagnosis of septic arthritis. Some of the pitfalls in the diagnosis of septic arthritis occur because of atypical features such as the frequent lack of fever or toxic state in the elderly patient, polyarticular infection in 10% to 20% of patients, and infected synovial fluids that do not necessarily appear purulent. Conditions that mimic septic arthritis, but in which the synovial fluid culture is truly negative, are referred to as pseudoseptic arthritis (Table 2). Awareness of this entity is essential in the initial evaluation of a patient with acute synovitis and in the subsequent management of such a patient when the synovial fluid culture is negative for bacterial growth.

When acute exacerbation of rheumatoid arthritis (RA) manifests with fever, chills, and purulent synovitis, it must be distinguished from acute bacterial arthritis complicating rheumatoid disease. Antibiotic therapy often is started pending the culture results. If all cultures are negative, no extra-articular site of infection is found, and there is no history of antibiotic administration before the collection of culture specimens, the possibility of rheumatoid disease flare should be considered. The occurrence of pseudoseptic arthritis in a RA population studied by Singleton et al was slightly more

frequent than true septic arthritis.⁵ Among 328 rheumatoid patients followed over 4 years, six instances of pseudoseptic arthritis and four of septic arthritis were encountered. The sterile synovial fluids had white blood cell (WBC) counts that ranged from 54,000 to 267,000 cells per ml. Two other series of similar pseudoseptic cases among RA patients had synovial fluid (SF) WBC counts of 35,000 to 395,000⁶ and 26,000 to 71,000 cells per ml.⁷ Polymorphonuclear

Table 1.—Differential diagnosis of septic arthritis*

Septic arthritis
Gonococcal
Non-gonococcal
Crystal-induced arthritis
Nonsuppurative infectious arthritis
Eubacterial (mycobacterial) infection
Fungal infection
Viral (hepatitis, rubella)
Syphilis
Lyme disease
Bacterial endocarditis**
Sexually acquired reactive arthritis**
Enteric arthritis**
Acute rheumatic fever**
Rheumatoid arthritis exacerbation

* Adapted from Esterhai and Gelb⁴ with modifications.

** Diseases that may mimic septic arthritis but in which no viable infectious agent has been demonstrated in the inflamed joint.

(PMN) cells predominated in all three series. A more recent report of three patients with multiple inflamed joints extends the phenomenon of pseudoseptic arthritis in RA to polyarticular involvement.⁸ Typically, the rheumatoid disease is not optimally controlled and the affected site is one or more large peripheral joints. Clinically, the patients with pseudoseptic arthritis can only be distinguished from those with septic arthritis by the negative SF Gram-stained smear, the negative culture results, and the response to glucocorticoids in the former.

In juvenile rheumatoid arthritis, a similar syndrome of fever and acute synovitis with SF cell counts in the range of 87,000 to 150,000 WBC per ml but negative culture

Conditions that mimic septic arthritis, but in which the synovial fluid culture is truly negative, are referred to as pseudoseptic arthritis.

has been observed.⁹

Acute gout or pseudogout share the following features with septic arthritis: acute onset, exquisite pain, single joint involvement, and inflammatory joint fluid. SF WBC counts greater than 50,000 cells per ml are generally considered highly inflammatory and are regarded as reflecting an infection unless an alternative etiology can be demonstrated. In a series of 388 synovial fluids from patients with definite diagnoses, 70% of those with culture-proven septic arthritis had SF WBC counts greater than 50,000 cells per ml, while 12.5% of gout patients, 10% of pseudogout patients, and 4% of RA patients had SF counts in this high range.¹⁰ Fever is uncommon with acute crystal-induced synovitis. However, when gout or pseudogout develops in a hospitalized patient, fever attributable to acute synovitis is present in upwards of a third of these patients.¹¹ Although the demonstration of sodium urate or calcium pyrophosphate dihydrate crystals in an inflammatory synovial fluid makes the diagnosis of crystal-induced synovitis, the possible coexistence of bacterial infection in the same joint must not be overlooked.¹² Another crystal-induced synovitis that can be confused with septic arthritis is apatite-associated arthropathy.¹³ The clue to this diagnosis is the radiologic periarticular calcific deposit.

The arthritis of Reiter's syndrome, psoriatic arthropathy, or even systemic lupus erythematosus¹⁴ may mimic septic arthritis with highly inflammatory but sterile synovial fluids. Sick cell disease can have a host of musculoskeletal manifestations. During sick cell crisis, bone and joint pain is common. Pain and swelling of the peripheral joints is usually monoarticular or pauciarticular and most commonly affect the knee and elbow joints. The typical SF WBC count is less than 1,000 cells per ml with a low percentage of PMNs. However, there have been reports of inflammatory SF in sick cell disease not associated with gout or bacterial infection.¹⁵ A patient I saw 10

ABBREVIATIONS USED

PMN: Polymorphonuclear (leucocytes)
PVS: Pigmented villonodular synovitis
RA: Rheumatoid arthritis
SF: Synovial fluid
WBC: White blood cells

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years ago has sickle cell anemia. At 30-years-old, she developed acute synovitis of the knees with cell counts in the range of 36,700 to 98,100 WBC per ml (82 to 88% PMNs) associated with fever and severe pain. Repeatedly the cultures of synovial fluid and synovial tissue revealed no growth. No crystals were found, even with the electron microscope. She had radiographic evidence of infarcts in the long bones, avascular necrosis of the hips, but no abnormality of the knees except for diffuse osteopenia. She responded to intra-articular steroids and has not had further problems with her knees for 10 years during which the hip disease had progressed.

Patients with sickle cell anemia are predisposed to bone and joint infections because of local ischemia and disorder in the alternative complement pathway that impair phagocytosis of certain bacteria. I saw in consultation a 26-year-old black male with sickle cell disease who developed a painful right shoulder with a small effusion during one of many painful crises. X-ray showed avascular necrosis of the humeral head that had been present for some time. Because he was afebrile and did not have peripheral leukocytosis, aspiration of the joint had been delayed for 3 days. When the pain worsened, arthrocentesis was finally carried out and purulent fluid obtained. Gram-positive cocci were seen and *Staphylococcus aureus* was cultured. What was initially felt to be a bland effusion associated with sickle cell crisis turned out to be septic arthritis.

Among 328 rheumatoid patients followed over 4 years, six instances of pseudoseptic arthritis and four of septic arthritis were encountered.

Transient synovitis of the hip¹⁶ is an acute painful monoarthritis of the hip that mimics septic arthritis. The patient may be febrile and the erythrocyte sedimentation rate (ESR) is invariably elevated, often rising to higher levels during observation. The synovial fluid is inflammatory (24,200 to 31,600 WBC per ml with 90% PMNs) but sterile. After aspiration of the joint, the acute synovitis typically remits in a matter of days. The etiology of this entity is unknown but the prognosis appears excellent with the resolution of pain, the restoration of function, and no joint damage.

Another mimicker of septic arthritis is plant thorn synovitis.¹⁷ The inflammation is usually monoarticular, and the history of injury in and around plants may have to be sought for specifically. The presentation can be acute or subacute and the synovial

Table 2.—Pseudoseptic arthritis

Condition	References
Rheumatoid arthritis	5,6,7,8
Juvenile rheumatoid arthritis	9
Gout	
Pseudogout	
Apatite-associated arthropathy	13
Reiter's syndrome	
Psoriatic arthritis	
Systemic lupus erythematosus	14
Sickle cell disease	15
Transient synovitis of hip	16
Plant thorn synovitis	17,18
Metastatic carcinoma	19
Pigmented villonodular synovitis	20
Hemarthrosis	21
Neuropathic arthropathy	22

fluid can be quite inflammatory ranging from 2,400 to 60,500 WBC per ml with 25-90% PMNs.¹⁸ The joint involved can be a large joint such as the knee, but more commonly the wrist or a small joint of the hand (eg, an interphalangeal joint or its tendon sheath) is affected. Excisional biopsy will provide tissue for precise diagnosis and cure the condition. The differential diagnoses include septic arthritis, osteomyelitis, monoarticular RA, bone tumor, and apatite deposition disease.¹⁸

Metastatic disease to bones is relatively common when compared to metastasis to a joint. In the latter instance, the clinical presentation of an acute synovitis can be mistaken for septic arthritis. Two patients with metastatic renal cell carcinoma presented with fever and acute monoarthritis: an inflamed ankle in a 57-year-old man and a painful hip in a 58-year-old woman.¹⁹ Both had elevated ESR (90 mm/hr and 78 mm/hr, respectively) and inflammatory synovial fluids (36,400 WBC/ml and 37,740 WBC/ml, respectively) that were culture negative. The pathogenesis was the secondary

involvement of the joint after metastases reached the bones of the joint; the talocalcaneal bones in the first case and the acetabulum in the second. The sterile synovitis may be an intense inflammatory response of the synovium against the malignant cells that broke through the bone and spilled into the joint space. I have seen a case of purulent synovitis of the wrist (SF WBC count greater than 100,000 cells per ml) that was initially treated for septic arthritis, but subsequent evaluation revealed a sterile synovitis that was the result of metastatic bronchogenic carcinoma.

Primary malignant neoplasm of the synovium is rare. Pigmented villonodular synovitis (PVS) is regarded⁴ as a benign neoplasm of the synovium and presents most often as recurrent hemarthrosis. The synovial fluids from PVS have an average WBC count of 3,110 per ml and the red blood cell counts range from 43,000 to 1,780,000 cells per ml. However, SF WBC count as high as 47,000 cells per ml with 96% PMNs has been reported in PVS.²⁰ Another cause of hemarthrosis is trauma, and traumatic arthritis can rarely mimic septic arthritis with marked SF leukocytosis.²¹ Two such cases were reported with low grade temperature (37.6° to 37.8°C) and monoarthritis of the knee with SF WBC counts of 52,200 cells per ml (89% PMN) and 29,100 cells per ml (74% PMN). The hematocrits of the synovial fluids were 7% and 6%, respectively. The pathogenesis of the inflammation was believed related to the possible phlogistic role of fat since phagocytosis of fat droplets was observed microscopically. Perhaps a similar pathogenesis is shared by a case of neuropathic arthropathy secondary to syringomyelia that was initially diagnosed as septic arthritis of the shoulder.²² The SF WBC counts ranged from 37,300 to 61,100 cells per ml with 93-

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98% PMNs. There was rapid radiographic destruction of the shoulder joint, yet the cultures of synovial fluids and synovial tissue were negative. Neither calcium pyrophosphate dihydrate nor hydroxyapatite crystals were found. Fat droplets and bone fragments were seen in the joint fluid. Lipid liquid crystals from blood or bone marrow and apatite crystals from bone may have stimulated the intense inflammation.

Septic arthritis requires prompt attention. The diagnosis must be considered when a patient presents with fever and acute monoarthritis. Synovial fluid analysis is necessary for the precise diagnosis of bacterial infection. The conditions listed in Table 2 can clinically mimic acute septic arthritis. These noninfectious entities should be considered when markedly inflammatory fluids are truly culture-negative.

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Advances in the Medical Management Of Chronic Arthritis

Bernard Zimmermann, III, MD
Edward V. Lally, MD

Therapy for chronic arthritis has traditionally emphasized the use of a multidisciplinary approach to patient care including education and social support, preventive measures, physical medicine modalities, pharmacologic anti-rheumatic treatment and surgical intervention under appropriate circumstances. Since no "cure" has been uncovered for most forms of arthritis, therapeutic strategies have been directed at the relief of musculoskeletal discomfort and the preservation of function. The pharmacologic management of the rheumatic diseases has been based historically on empiricism. Anti-inflammatory drugs and immunosuppressive agents have been demonstrated to provide short-term benefit in clinical studies and have stood as the cornerstones of anti-rheumatic treatment for many years. However, the exact mechanisms of action of these agents as well as the specific reasons they exert clinical benefit have not been elucidated.

Within the past decade, advances in molecular biology and immunology have provided significant insight into the pathogenesis of arthritis and related rheumatic disorders. Research in the areas of immunogenetics, inflammation, cellular immunology and connective tissue biology has been extremely productive and has provided a framework for the development of specific treatments designed to reverse or retard pathophysiologic processes that involve articular inflammation and destruction. In order for the fruits of this research to be fully realized, it must result in more specific interventions that will significantly advance rheumatologic therapeutics.

We will review recent developments in anti-rheumatic drug therapy including the refinement of anti-inflammatory agents and the development of more specific immunomodulating drugs and potential "disease-modifying" agents. Newer treatment strate-

gies for the two most common forms of chronic arthritis, rheumatoid arthritis and osteoarthritis, will be discussed. Consideration will be given to the use of anti-inflammatory and/or immunosuppressive agents in combination to treat patients with refractory or unrelenting rheumatic disease. Finally, we will highlight recent advances in the prevention and treatment of complications associated with anti-rheumatic drug therapy.

Non-Steroidal Anti-Inflammatory Agents (NSAIA)

Salicylates and other non-steroidal anti-inflammatory agents (NSAIA) currently are the mainstays of pharmacologic management of both inflammatory and non-inflammatory chronic arthritis. These weak organic acidic compounds exert anti-pyretic, anti-inflammatory and analgesic effects principally through their interactions with arachidonic acid, a substrate metabolized from phospholipids.¹ The two major metabolites of arachidonic acid are the prostaglandin derivatives and the leukotrienes, which function independently or synergistically to mediate inflammation. Each NSAIA inhibits the enzyme cyclo-oxygenase, which catalyzes the conversion of arachidonic acid to thromboxane and the prostaglandins. This inhibition appears to be responsible primarily for the salutary, as well as the adverse, effects of these drugs. The currently available NSAIAs are listed in Table 1. All the non-salicylate NSAIAs compare favorably to aspirin, administered in equivalent anti-inflammatory doses, in clinical efficacy studies involving patients with chronic arthritis. Treating arthritis patients with NSAIAs is an empiric exercise and requires a trial-and-error approach to effect symptomatic improvement and to avoid associated toxicity.² New drugs in this category have been developed specifically to improve patient compliance (by providing more convenient dosing regimens or by decreasing side effects), or to reduce the frequency or severity of specific adverse effects.

The individual response of patients to NSAIA therapy is so variable that it appears

Since no cure has been uncovered for most forms of arthritis, therapeutic strategies have been directed at the relief of musculoskeletal discomfort and the preservation of function.

likely that some of the beneficial effects in those who respond to a given drug are due to factors other than cyclo-oxygenase inhibition, a property common to each of these compounds. Research efforts have focused on the identification of additional mechanisms of action of these drugs, particularly those that may explain differences in clinical effectiveness among the NSAIAs. Many *in vitro* studies have demonstrated that NSAIAs exert prostaglandin-independent effects such as the inhibition of lipooxygenase, the prevention of neutrophil chemotaxis and activation, the suppression of chondrocyte function, and the inhibition of membrane-associated processes such as superoxide anion generation. There may be considerable diversity among the NSAIAs regarding these latter effects and these observations may explain the heterogeneous responses noted in arthritis patients who initiate therapy with these medications.

In the treatment of rheumatoid arthritis (RA), NSAIAs should be administered on a regular basis in anti-inflammatory doses for at least 3 to 4 weeks before determining clinical benefit or failure. Often, two, three or more NSAIAs must be tried before efficacy is achieved. In osteoarthritis (OA), NSAIAs may exert benefit by either their anti-inflammatory or their analgesic effects. Thus symptomatic improvement may accrue at a relatively lower (analgesic) dose in patients with OA compared to those with RA. Also, in OA, NSAIAs may be administered as needed according to symptoms rather than on a regular basis. It should be noted that none of the newly released NSA-

ABBREVIATIONS USED

DMARD: Disease-modifying anti-rheumatic drug
FDA: Food and Drug Administration
GI: Gastrointestinal
H₂: Histamine-2
MTX: Methotrexate
NSAIA: Non-steroidal anti-inflammatory agents
OA: Osteoarthritis
PG: Prostaglandin
PGE: Prostaglandin-E
RA: Rheumatoid arthritis

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Table 1.—Non-Salicylate Non-Steroidal Anti-Inflammatory Agents 1993

Drug	Year Approved By FDA
Phenylbutazone	1952
Indomethacin	1961
Mefenamic Acid	1967
Ibuprofen	1974
Fenoprofen	1976
Tolmetin	1976
Naproxen	1976
Sulindac	1978
Meclofenamate	1980
Piroxicam	1982
Diclofenac	1988
Ketoprofen	1988
Flurbiprofen	1989
Etodolac	1991
Nabumatone	1991
Oxaprozin	1993

IAs have proved superior to conventional anti-inflammatory agents in patients who tolerate appropriate doses of these compounds. However, newer NSAIDs may be recommended for improved compliance or tolerability.

The potential for serious adverse effects from the NSAIDs is significant and probably underestimated. The most common adverse effect limiting long term management of chronic arthritis with NSAIDs is gastrointestinal (GI) intolerance.³ Dyspepsia and epigastric pain from NSAIDs may be caused by gastritis, esophagitis or peptic ulceration. Of more concern is the occurrence of occult upper GI blood loss or asymptomatic gastric ulcers. Even though the relative risk of serious complications from NSAID-induced gastric mucosal ulceration is fairly low (estimates are 1.5% to 4.0%), there is cause for considerable concern due to the large number of patients receiving these agents. Administering NSAIDs after meals or in conjunction with antacids may diminish adverse GI effects. Mucosal ulceration of the small intestine associated with NSAIDs has been emphasized recently.⁴

Various pharmacologic approaches have been developed to prevent or treat gastropathy associated with NSAID therapy. Histamine-2 (H₂) blocking agents have been employed for prophylaxis of NSAID-associated gastropathy. Cimetidine was not shown to be beneficial for this purpose in a long-term, double-blind study.⁵ However, a newer H₂ blocker, ranitidine, was demonstrated to afford protection against the gastric effects of aspirin.⁶ Sucralfate, a non-absorbable polysaccharide, has been touted as a cytoprotective agent because of its ability to bind to mucosal defects and pre-

vent the adverse effects of NSAIDs. Preliminary studies of sucralfate have shown benefit for the prevention of NSAID gastropathy.

Since prostaglandins (particularly those of the PGE series) promote normal mucosal homeostasis in the stomach, inhibition of these compounds is believed to contribute directly and indirectly to the development of NSAID-induced gastropathy. Synthetic prostaglandins have been developed and employed as therapeutic agents specifically to prevent the development of gastric mucosal lesions secondary to NSAIDs. Miso-prostol, a PGE₁ analog, inhibits gastric acid secretion and stimulates the gastric mucosa to secrete surface-active phospholipids and bicarbonate, thus offering a cytoprotective effect. This drug has been demonstrated to prevent NSAID-induced gastric ulcers in a short-term study.⁷ However, the cost-benefit ratio for prophylaxis by this agent has yet to be determined. It is costly, has potential side effects, and probably should be reserved for patients at increased risk for the development of NSAID-induced gastropathy.

Another major adverse effect of NSAIDs is the development of renal insufficiency and other renal syndromes. During low-perfusion states, renal blood flow is dependent on PGs and inhibition of these compounds may result in renal insufficiency or kidney failure. There is an increased recognition that all of these agents may induce this clinical syndrome, including sulindac. With the advent of over-the-counter ibu-

Table 2.—Investigational Drugs for Rheumatoid Arthritis

Sulfasalazine
Cyclosporin A
Amiprilose hydrochloride
Interferon-gamma (INF-γ)
Interleukin-1 inhibitors
Monoclonal antibodies

profen, and the likelihood that several other NSAIDs will be made available on a non-prescription basis, there is appropriate concern about associated drug toxicity, particularly acute renal failure.

Newer Treatments for Rheumatoid Arthritis

Many patients with RA will experience sustained symptomatic improvement from NSAIDs and will be effectively managed with these agents alone. However, 30% to 50% of RA patients will have unsatisfactory relief of arthritis symptoms even after several adequate courses of NSAIDs, or will have roentgenographic evidence of progressive joint damage despite adequate symptomatic control with anti-inflammatory agents, rest and physical therapy measures (conservative treatment). Such patients should be considered for second-line or disease-modifying anti-rheumatic drug (DMARD) therapy. The traditional agents considered in this category are the anti-malarial compounds (chloroquine, hydroxychloroquine), gold, and d-penicillamine. Although the potential for adverse effects

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from these agents is considerable, they have been employed routinely because they allegedly have disease-remitting properties and can potentially alter disease outcome in patients with progressive arthritis. As with NSAIDs, the use of DMARDs has been based historically on therapeutic empiricism and the exact mechanism of action of most of these drugs remains obscure. However, individual patients may experience dramatic clinical improvement while receiving DMARDs. Therefore, efforts have been expended to improve patient tolerance for these compounds and to provide more acceptable delivery systems. Thus, the use of hydroxychloroquine instead of chloroquine has been associated with far fewer ocular and cutaneous adverse effects. Similarly, an oral preparation of gold (auranofin) has been developed recently and shown to be of benefit in some patients with RA. Several studies have demonstrated the efficacy of auranofin in RA but the degree of improvement is not as great as that noted with parenteral gold.⁸ The initial enthusiasm for this agent has diminished somewhat in recent years.

Perhaps the most significant development in rheumatologic therapeutics in the past decade has been the use of the antimetabolite, methotrexate (MTX), to treat patients with RA. MTX has been known to

be effective for RA and psoriatic arthritis since the early 1950s, but only in the past decade have rigorous clinical trials proved the safety and efficacy of low-dose, weekly MTX for the management of patients with RA. In 1988, MTX was approved by the FDA for use in this disorder. Cautious enthusiasm for MTX therapy has resulted from studies demonstrating rapid improvement (within 4 to 6 weeks) in pain, stiffness and articular swelling. Maximal clinical benefit is usually achieved after about 6 months and sustained suppression of disease activity lasting for up to 7 years has now been demonstrated.^{9,10} MTX therapy has also been shown to effect significant improvement in sophisticated measurements of activities of daily living, social interactions and emotional function.

Hepatotoxicity from MTX is a major concern during treatment of RA with this drug. Liver fibrosis and cirrhosis are potential long-term complications of MTX therapy. The true incidence of serious hepatic fibrosis from MTX in RA is probably quite low (less than 1%) when low-dose (7.5-15 mg/week) pulse MTX therapy is employed. Risk factors for the development of MTX-induced hepatic fibrosis include obesity, diabetes mellitus and concomitant alcohol consumption. Since indirect measurements of liver function (hepatocellular enzymes,

radionuclide scans) are not reliable indications of hepatic toxicity, pre-MTX liver biopsies should be performed in high-risk patients and repeated periodically if MTX is to be continued. Less common, but potentially more dangerous, adverse effects such as acute pneumonitis and bone marrow suppression may also develop from MTX. Complete blood counts and renal function tests should be obtained regularly in all patients receiving MTX. Despite its potential toxicity, MTX appears to have an acceptable cost-benefit profile. Many rheumatologists now routinely initiate second-line therapy for RA with MTX rather than with other conventional DMARDs.

In patients with progressive or refractory RA or in patients with significant extra-articular manifestations of the disease (vasculitis, cardiac or pulmonary complications, neurologic deficits), cytotoxic or immunosuppressive agents have been employed. The major agents used for this purpose are azathioprine and cyclophosphamide. Studies involving small numbers of selected patients have demonstrated short-term improvement, and even reversal of life-threatening complications with these drugs, but the mechanism of action is unknown and adverse effects occur frequently. There has even been consideration given recently to combination chemotherapy with "cocktails"

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of traditional DMARDs and cytotoxic agents for patients with severe, unremitting RA. Short-term improvement in some clinical parameters has been observed with certain patients in this category, but substantial long-term benefit has not been demonstrated, and major toxicity with this form of treatment occurs commonly.¹¹

Besides traditional DMARDs and immunosuppressive agents, a number of conventional and investigational compounds have been administered to small numbers of patients with RA to assess their potential for disease modification (Table 2). Sulfasalazine is an anti-inflammatory, anti-rheumatic drug that has been studied recently with renewed interest. Controlled trials have shown sulfasalazine to be superior to placebo and similar in efficacy to other DMARDs for the treatment of RA.¹²

An improved understanding of the central role of the immune system in the pathogenesis of RA may lead to the development of a more sophisticated armamentarium of agents directed at specific immunologic defects in RA. Cyclosporin A, a specific inhibitor of T-helper cell activation has produced substantial clinical improvement in certain patients with uncontrolled RA. Studies have demonstrated significant benefit from this agent, particularly in patients with refractory RA, but the toxicity of cyclosporin

may preclude its extensive use.¹³ A compound that has been evaluated in clinical trials recently is amiprilose hydrochloride, a synthetic monosaccharide that has both anti-inflammatory and immunomodulatory properties. The exact mechanism of action of this agent is unknown, but it has produced clinical benefit in RA during preliminary investigations.¹⁴ Therapy to inhibit or enhance cytokine effects in RA has been investigated because of research indicating a central role for these informational molecules in the pathogenesis of this disease. The ability of monospecific, monoclonal antibodies to target abnormal pathways in RA may be used therapeutically in the future. Already, clinical trials using monoclonal antibodies directed against T-cell surface antigens or against interleukin-2 receptors are underway in this disorder. Although it is theoretically possible to interrupt the immune pathway in this fashion, extending such *in vitro* concepts to the clinical arena will require many years of additional study.

Newer Treatments for Osteoarthritis

Osteoarthritis (OA), the most common form of chronic arthritis, is characterized by articular cartilage degradation and by reac-

tive new bone formation in the subchondral plate and at the joint margins. Cartilage matrix (proteoglycan) is depleted, usually by enzymatic degradation, although mechanical factors appear to trigger the process in a focal fashion within the joint. The critical mismatch in OA is the inability of chondrocytes to increase the synthesis of new matrix at, or above, the rate of enzymatic digestion. Clinically, OA results in pain and dysfunction in affected joints. Management strategies for symptomatic patients with OA include optimizing biomechanical advantages (especially in the spine and weight-bearing joints), providing physical therapy measures, administering pharmacologic agents to relieve pain and reduce inflammation and considering an array of options for surgical intervention under appropriate circumstances. Data from the Framingham Study has demonstrated that weight reduction reduces the risk for the subsequent development of osteoarthritis of the knee.¹⁵ Drug treatment for OA is empiric, and little evidence exists suggesting that available therapy is disease-modifying. Future developments in the treatment of OA should include the use of agents designed to enhance chondrocyte synthetic capacity in a controlled fashion or inhibit mediators responsible for matrix depletion.

Currently, NSAIDs are the drugs used

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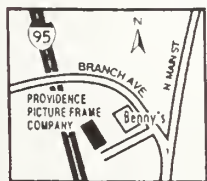
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most often to control pain and inflammation in OA. There is considerable evidence that joint inflammation plays a major role in symptomatic OA.¹⁶ This inflammation may be mediated by a variety of crystals (calcium pyrophosphate, hydroxyapatite, urate) or by the products of cartilage degradation, particularly proteoglycan subunits. Pain in OA results from irritated nerve endings in the periosteum, from microfractures in the subchondral bone, from distention of the joint capsule, or from inflammation in the synovial membrane or peri-articular structures. NSAIDs may produce symptomatic relief because of their anti-inflammatory or analgesic properties. An important recent study suggested that acetaminophen alone is beneficial in relieving the symptoms of osteoarthritis of the knee.¹⁷

Compounds administered directly into the joint may reduce pain and inflammation in OA. The intra-articular injection of corticosteroids has been used effectively in this disorder. It appears that patients with OA and clinical joint inflammation (warmth, synovial effusion) are more likely to respond to this form of treatment. Appreciation of the importance of the free-radical anion, superoxide, has led to trials of the metalloprotein, superoxide dismutase (or-gotein), for intra-articular injection with

some encouraging results.¹⁸ Attempts to inhibit degradative enzymes, such as the neutral proteases, with metal chelators, including EDTA have met with mixed results in *in vitro* rabbit studies.¹⁹

The importance of periarticular soft tissue structures as a source of pain in OA is now recognized. Tendons, bursae and ligaments may be stretched or inflamed due to biomechanical instability, or to irritation by local osteophyte formation. The appropriate treatment of bursitis and tendinitis with heat, rest and occasional local corticosteroid injections may dramatically improve nighttime pain associated with OA. Physical medicine modalities such as canes, braces and orthotics as well as appropriate therapeutic intervention by physical and occupational therapists may be extremely beneficial as well for patients with OA.

Pain Modulation

Pain is the overwhelming symptom experienced by patients with both inflammatory and non-inflammatory chronic arthritis. When uncontrolled inflammation is the predominant cause of pain, the use of anti-inflammatory and, occasionally, immunosuppressive agents is the most appropriate response to relieve arthritic symptoms.

However, even when inflammation is well controlled with appropriate medication, many patients with chronic arthritis still experience pain due to structural joint disease or periarticular pathology (bursitis, tendinitis). Chronic pain from articular or periarticular structures frequently leads to functional deterioration that may be out of proportion to the severity of the arthritis. Under these circumstances, pain is directly responsible for creating a cycle of reduced joint motion, flexion contractures, muscle weakness and atrophy and significant functional impairment. NSAIDs may provide inadequate pain control under these circumstances.

There has been considerable interest recently in alternate means of pain modulation for patients with chronic arthritis. The use of pure analgesic compounds (such as acetaminophen or propoxyphene) has been employed in patients with RA and OA. Many of these patients will experience considerable functional improvement when such pain-relieving compounds are administered. The use of anti-depressant medication, including the tricyclic compounds, has proven particularly useful in controlling pain and stiffness in patients with chronic arthritis. Low dose anti-depressant medication, administered at bedtime, has been

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shown to improve night pain and morning stiffness in patients with RA.²⁰ Considerable research is currently underway on the use of such agents to manage pain in patients with chronic arthritis.

Conclusions

A clearer understanding of pathogenetic mechanisms in both inflammatory and non-inflammatory chronic arthritis has provided a rationale for the development of more specific agents to reduce inflammation and to provide symptomatic improvement for patients with these disorders. In this article, we have reviewed both traditional and newer methods of pharmacologic treatment for RA and OA. More specific and selective methods of interrupting arthritic pathways is the goal of rheumatologic research now. Therapy should emphasize the maintenance of function in individuals with chronic arthritis. Future treatments will be directed not only at the relief of pain and inflammation but also specifically at the goal of improved functional outcomes.

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Complete references available on request.

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Advances in the Surgical Treatment of Arthritis

Roy K. Aaron, MD

Surgical intervention is advised for pain and disability unresponsive to conservative management.

Many surgical procedures are available for the patient with arthritis to prevent or correct deformity, restore joint mobility and relieve pain, with the goals of reducing disability and maintaining independent function. This article will highlight the more common and particularly effective procedures. The indications for specific procedures are discussed in each section below.

Generally, surgical intervention is advised for pain and disability unresponsive to conservative management. The extent of pain and the disability it causes needs to be assessed according to the functional requirements of the patient. One simple and effective method of assessing pain is the modified d'Aubigne pain score with added questions to assess the functional limitations imposed by pain (Table 1).¹ Most patients with spontaneous night or rest pain (Grade 0-1) are candidates for reconstructive surgery. Patients falling into Grades 2 and 3 are candidates for surgery while patients in Grade 4 and above are not. Structural compromise and mechanical derangement such as bone loss, ligamentous instability, angulatory deformity and loss of motion are mechanical complications of arthritis that add relative indications for surgery.

Hip Arthroplasty

Arthroplasty of the hip is a true "total" joint replacement. Bone and supporting ligaments and capsule are excised and replaced with implants that substitute for the function of all these tissues. Contemporary implants have a metal-backed polyethylene socket and a femoral component of either cobalt-chrome alloy or titanium. The implant is fixed to the bone with methylmethacrylate bone cement or by press-fit for bone ingrowth.

Total hip replacement (THR) has been refined to provide a more durable implant and to prevent loosening at the implant-

bone interface. With previous generations of implants, loosening rates have approximated 20% to 25% at 15-year follow-up.^{2,3} Loosening has been thought to be due to failure of the bone cement at either the implant-cement or the cement-bone interface. One response to the failure of bone cement has been improved cement techniques to provide a more durable bond. These techniques include removal of air voids to provide greater cement strength, the creation of a more durable implant-cement interface, and insertion of cement

out limitation. Suggested activities after total hip replacement include swimming and bicycle-riding, but activities that involve impact-loading, such as running or jumping, should be avoided as they subject the implants to high peak forces and increase the risk of loosening. The complications of particular concern associated with THR are dislocation, infection and venous thrombosis. Dislocations can be traumatic or spontaneous. Traumatic dislocations are associated with extremes of positioning especially flexion, adduction, and internal rotation,

Table 1.—Modified D'Aubigne Pain Scale

Pain Score	Criteria for Assignment of Pain Score
1. Severe, spontaneous	Presence of night or rest pain
2. Severe on attempting to walk; prevents all activities	Walking tolerance <1 block or 50 yards
3. Pain tolerable, permitting limited activity	Walking tolerance < 2-3 blocks; requires narcotic analgesics
4. Pain only after some activity; disappears quickly with rest	Walking tolerance > 2-3 blocks; requires nonnarcotic analgesics
5. Slight or intermittent pain on starting to walk but less with normal activity	Presence of pain at end of day; gelling may occur when changing positions
6. No pain	No pain

under pressure to enhance the cement-bone interface. Another response has been to avoid cement altogether and use implants with porous-coated or textured surfaces into which bone grows and forms a biological, permanent bond (Figure 1). Implants of this type are press-fit into a stable position and protected against full weight bearing until bone ingrowth. Although opinions vary widely across the country, many surgeons use press-fit, uncemented implants in younger patients with good bone stock and use cemented implants for older patients with osteopenia or compromised bone strength.

Surgical techniques optimize muscular and weight-bearing forces around the hip reconstruction, equalize leg lengths, and, therefore, optimize forces to which the implant is subjected (Figure 2). With proper implant selection and meticulous technique, about 95% of patients having total hip replacement should experience successful early results. The reconstruction essentially should provide complete pain relief and a flexion-extension arc of at least 100° with 30° of abduction. Patients should be able to sit, walk, and climb stairs comfortably with-

in which hip motion exceeds that permitted by the implant. Spontaneous dislocations are caused by poor component position, especially socket flexion and abduction and failure to restore leg length equality. The incidence of infection should be no more than 1%. Many infections, especially with acute Gram positive organisms, can be treated retaining the original components. Chronic or Gram negative infections often require removal of the implant and secondary reconstruction. Recently, with the advent of low dose Coumadin prophylaxis for venous thrombosis, the incidence of femoral vein thrombosis should be no higher than 10% and the incidence of pulmonary embolism 0%.^{2,4,5}

Special situations call for more advanced surgical techniques. Two such situations

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ABBREVIATIONS USED

CC: Calcanecuboid (joint)
TC: Talocalcaneal (joint)
TN: Talonavicular (joint)
THR: Total hip replacement
TKR: Total knee replacement
TSR: Total shoulder replacement

deserve mention here: 1) extreme bone loss requiring grafting; and 2) loosening of previously placed implants. Bone loss is more commonly seen in rheumatoid arthritis but can certainly be seen in post-traumatic situations, osteoarthritis and in revision arthroplasties. In essentially all conditions of bone loss, it is desirable to add bone, often banked allograft, which may be as cancellous fragments or solid block. Successful graft incorporation will increase bone stock and support implants (Figure 3). Loosening of THR implants is treated by revision arthroplasty. Technetium and gallium scans and aspiration of synovial fluid for cell count and culture help to distinguish between septic and aseptic loosening. Aseptic loosening is treated by the removal of old components and cement and the implantation of revision components. Bone loss often requires special techniques including special implants and bone grafting. Loosening associated with acute infections or Gram positive infections can be treated by thorough debridement, intravenous antibiotics, and exchange arthroplasty. Septic loosening with Gram negative or other high virulence organisms is treated by removal of components and cement, debridement of capsular and synovial tissues, and a course of antibiotics before reimplantation of another prosthesis.



Fig 1.— Total hip replacement. Implanted components demonstrating region of implant-bone contact for immediate stabilization (arrows) and textured region for bone ingrowth (asterisk).



Fig 2.—Correction of deformities with THR and optimized biomechanics. Top left, superolateral migration of the femoral head in osteoarthritis with acetabular osteophytes (arrow), 13 min. leg length discrepancy, and shortened abductor length. Top right, reconstruction with THR returning the center of rotation medially and distally to normal, equalizing leg lengths and, restoring muscle balance. Bottom left, medial migration of the femoral head in rheumatoid arthritis with thinning of the acetabular wall (arrow) and 15 min. leg length discrepancy. Bottom right, reconstruction with THR and thick acetabular component lateralizing the center of rotation, restoring leg lengths and optimizing muscle forces.



Fig 3.—Severe bone loss and acetabular protrusion in rheumatoid arthritis. Left, bilateral protrusion of the femoral heads through the medial wall of the acetabulum (arrows) with marked erosion and flattening of the femoral heads. Right, reconstruction with medial acetabular bone graft (arrows).

Knee Arthroplasty

Unlike THR, total knee replacement (TKR) does not sacrifice ligaments and capsule. Quite to the contrary, it depends upon the soft tissues around the knee to provide stability while the implant resurfaces the damaged bone. The femoral component is fabricated of a cobalt-chrome alloy in an anatomic configuration to the distal femur with the patellar and tibial surfaces replaced by polyethylene components (Figure 4). Contemporary TKR employs implants with minimal intrinsic constraint, relying on the ligaments and capsule to absorb rotational forces rather than transmit them to the bone-implant interface. The technical goals of the procedure are to achieve static physiological alignment of components, restore normal limb alignment and balance the supporting medial and lateral ligaments.

The durability of TKR is related to the magnitude and distribution of forces applied to the bone-implant interface. Eccentric or angular loading of the implants predisposes to high peak loads at the bone-implant interface and to implant loosening.⁶ Surgical techniques are designed to promote even load distribution by placing the resurfacing implants in physiologic position relative to their respective bones, realigning the limb and the line of weight bearing forces, and reconstructing or stabilizing the surrounding soft tissues. With well placed contemporary implants, TKR should provide pain relief, a range of motion from full extension to 110°-120° of flexion, correction of angulatory deformity, and good medial-lateral stability. As in the case of THR, patients with TKR are advised not to run or to subject the implant to impact loads. Long-term results with



Fig 4.—Total knee replacement. Left, angulatory deformity in osteoarthritis secondary to asymmetric bone loss and ligament imbalance. Right, reconstruction with TKR restoring normal limb alignment and weight bearing forces physiologic alignment of components, and retensioning of soft tissues.

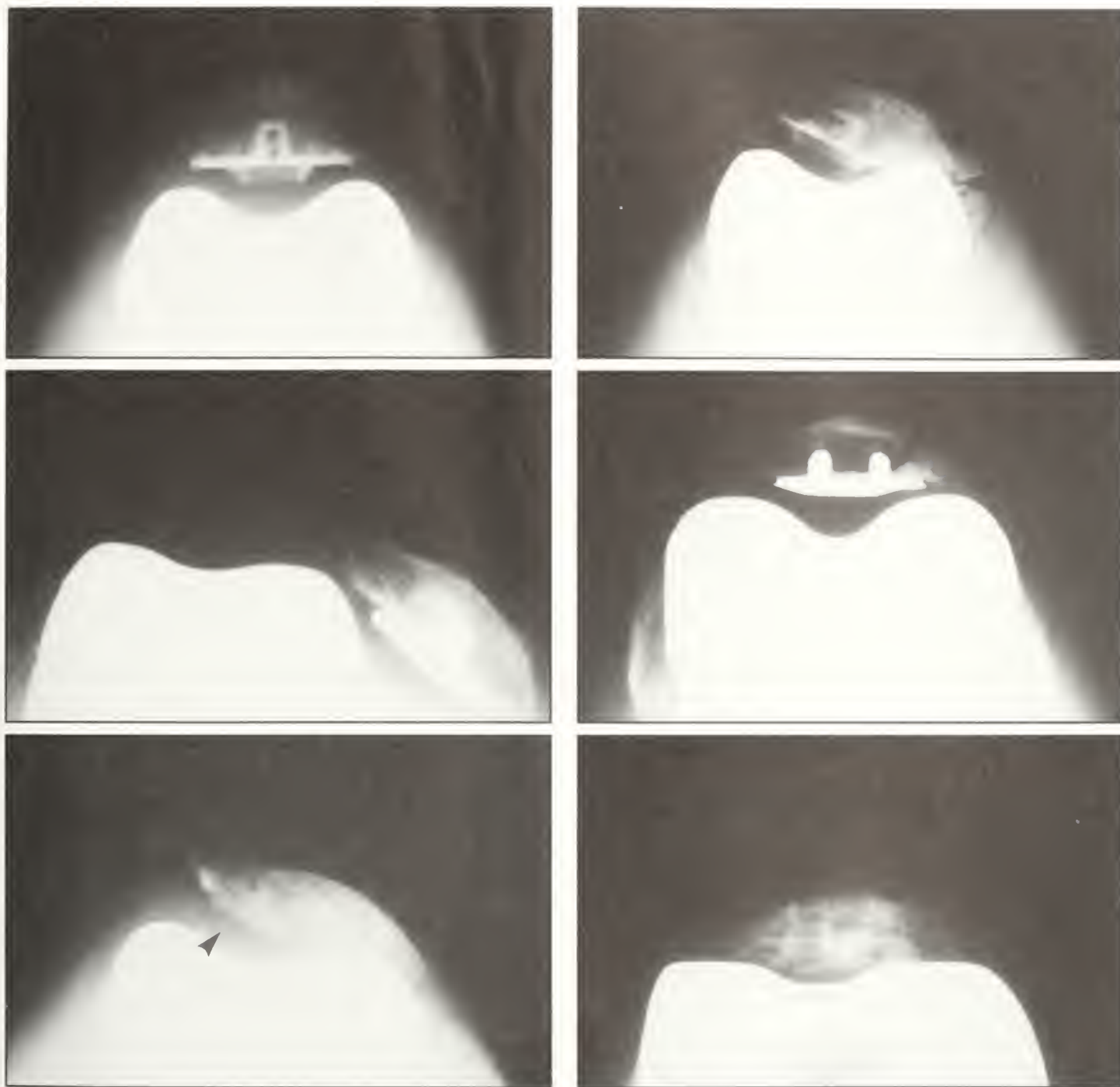


Fig 5.—Patellar complications after TKR. Top left, perfect alignment of the patellar component in the femoral groove. Top right, tilting of the patella and lateral impingement. Middle left, patellar dislocation. Middle right, patellar fracture. Bottom left, loosening with separation of the prosthesis (arrow) from the patella. Bottom right, osteonecrosis with mottled sclerosis and lucency.

TKR suggest that good or excellent results can be achieved in 90% of the procedures.⁷

Most of the mechanical complications following TKR are concerned with the extensor mechanism and consist of patellar subluxation or dislocation and patellar fracture (Figure 5). Venous thrombosis usually occurs below the popliteal area where the potential for pulmonary embolism is low. Controversy surrounds the issue of whether patients with TKR require prophylactic anticoagulation since the incidences of both

pulmonary embolism and post-phlebotic changes are low. Infection rates after TKR should be no higher than 1%. The incidence of loosening of TKR components is probably no higher than 4% at 10 years follow-up.

In knees with substantial bone loss, from the primary disease process or loosening of previously placed implants, bone grafting has been extremely successful in restoring bone stock (Figure 6). Incorporation of bone graft occurs within 6 to 12 months and offers excellent implant support. As in the

case of all joint implants, the plan for salvage after loose TKR depends upon the extent of bone loss and the association of sepsis. Aseptic loose TKR, or loose components infected with a low virulence organism, can be treated by removal of the components, debridement and reconstruction with special components. Loose TKR infected with Gram-negative or high virulence organisms is treated by removal of the components, debridement, insertion of an antibiotic-impregnated spacer, and intrave-

nous antibiotics prior to the insertion of new components.

Arthroscopy

While techniques exist for arthroscopy of most joints, arthroscopic procedures are most commonly performed on the knee. Arthroscopy in the arthritic knee can be carried out for either diagnostic or therapeutic purposes (Table 2).

Diagnostic arthroscopy is particularly useful for the investigation of disproportionate or atypical pain or where the diagnosis of arthritis is difficult. Meniscal tears, loose bodies, and other mechanical derangements quite often coexist with, and may be related to, rheumatoid or osteoarthritis. These derangements are a common source of disproportionate pain and associated mechanical symptoms of locking or buckling. They are easily diagnosed arthroscopically and are often amenable to treatment, relieving a considerable proportion of a patient's symptoms, even with significant underlying arthritis. Arthroscopic examination affords the opportunity to determine the extent of arthritic lesions and then direct therapy. Conventional radiographs quite often do not represent the full extent of arthritic lesions.⁸ Twenty-nine percent of patients with apparent disproportionate knee pain may have significant arthritic lesions demonstrated arthroscopically despite relatively normal X-rays. Arthroscopic examination can facilitate preoperative planning for larger procedures, particularly the choice among tibial osteotomy or unicompartmental or total knee replacement. When the diagnosis of arthritis is obscure, synovial biopsy can be obtained under arthroscopic guidance. Biopsies are obtained under direct vision, insuring that the tissue obtained is from the most affected or abnormal synovium and minimizing sampling errors. Finally, patellofemoral abnormalities and chondromalacia can be studied in detail arthroscopically and the extent of cartilage lesions revealed. These conditions often present clinically with atypical, often poorly localized, anterior knee pain due to one of several patellar disorders and is occasionally confused clinically with tibiofemoral arthritis.

Therapeutic arthroscopy has a distinct and important role in the management of the arthritic knee. Mechanical derangements such as meniscal tears and osteochondral loose bodies may be associated with, or the result of, the underlying arthritis but may be the cause of a sudden increase in pain. They also produce joint locking or instability. Cartilaginous fragments and loose material can be removed arthroscopically, often pro-



Fig 6.—TKR with grafting for severe bone loss. Left, loss of tibial plateau bone (arrows) associated with severe angulatory deformity. Right, reconstruction with bone graft (asterisk) at 1-year postoperative with trabecular bridging at the graft-host site (arrows).

Table 2.—Arthroscopy in the Arthritic Knee

1. Diagnosis and treatment of co-existing mechanical derangements
 - a. Meniscal tears
 - b. Loose bodies
 - c. Plicae
 - d. Osteochondritis dissecans
 - e. Cruciate ligament tears
2. Irrigation for sepsis and crystalline arthropathy
3. Debridement and chondroplasty
4. Synovial biopsy and synovectomy
5. Diagnosis and management of patellofemoral pain and chondromalacia

ducing a significant improvement in symptoms. Of our series of 94 patients with arthritis undergoing arthroscopy, 23 had an intraoperative diagnosis of associated mechanical problems and all were treated. Nineteen (83%) experienced significant relief of pain and mechanical symptoms with an average of 2 years follow-up. Treatment of the arthritic condition itself may take the form of debridement and lavage, chondroplasty, abrasion arthroplasty or synovectomy. Joint debridement and lavage is most useful in crystalline arthritis (primarily gout and pseudo-gout) and unresponsive infection. Intra-articular cartilaginous debris and breakdown products originate from chon-

dromalacic or arthritic cartilage and have been associated with inflammatory synovitis.⁹ A chondroplasty, or debridement of loose and damaged articular cartilage, and reshaping of the articular surface, has been shown to be effective in reducing debris-associated synovitis, reducing pain and inflammation, and improving joint motion. In our series, 26 patients with osteoarthritis were treated with chondroplasty. Twenty (77%) with lesions less than 20 mm² exhibited significant decrease in pain and an increase in gait. When the cartilaginous surface is lost with exposure of subchondral bone, some authors have recommended abrasion arthroplasty. This procedure denudes the subchondral bone in an attempt to stimulate a neocartilaginous ingrowth. In our experience, patients with very small lesions may experience some benefit but when the area of exposed bone is greater than 10 mm², or when it is on a directly weight-bearing surface, only about a third of patients are improved. Arthroscopic synovectomy is quite useful in debriding bulky, hypertrophic synovium and can be accomplished with less morbidity and more abbreviated rehabilitation than can open synovectomy. We have found it to be less useful for the control of chronic effusions associated with minimal synovial hypertrophy.

Disorders of the patellofemoral joint commonly cause knee pain. Patellar dislocation and recurrent subluxations are fairly

common. Transient or subtle malalignment can cause eccentric load distribution, termed the "excessive lateral pressure syndrome." Excessive load bearing predisposes to chondromalacia and patellofemoral pain, characteristically described as a vague anterior pain, becoming worse on loading the limb with the knee flexed such as is the case with crouching or climbing stairs. In addition to diagnosis, arthroscopy affords the opportunity to quantify the extent of patellofemoral realignment and chondromalacia, carry out cartilage debridement and assist in ligament and capsular release and rebalancing of patellar alignment.¹⁰

Arthrodesis and Arthroplasty of the Foot and Ankle

Pain, instability, and deformity of the foot and ankle produce considerable morbidity in the arthritic patient, preventing a stable painless base for gait. Surgical procedures on the arthritic foot and ankle are often among the most gratifying in terms of relief of symptoms. Two types of procedures have been shown to be particularly useful: 1) stabilization procedures (arthrodesis) for the ankle, hindfoot, and midfoot; and 2) resection or interposition arthroplasty and realignment procedures for metatarsalgia and forefoot deformities.

Arthritis of the ankle, hindfoot, or midfoot is usually manifested clinically by pain in gait and loss of range of motion. Arthrodesis, or fusion, of these joints can correct these deformities, abolish pain, and provide stability so that stance and gait are improved. Since arthritis of these joints is usually accompanied by a loss of range of motion, the additional degree of motion loss induced by the arthrodesis itself is small and is usually well compensated for by the provision of a painless and stable foot. Although several forms of arthritis affect the ankle, hindfoot and midfoot, rheumatoid arthritis is most common and produces ligamentous laxity and joint destruction leading to a flat, pronated foot. This is characterized by the complex of peritalar joint destruction, valgus deformity of the heel, loss of the longitudinal arch, and pain. In the triple arthrodesis, the talocalcaneal, talonavicular, and calcaneocuboid joints are fused and angular deformities are corrected by removing appropriately shaped bone wedges. (Figure 7).

The proper tibiotalocalcaneal angle is reconstructed (5° valgus) so that the normal weight-bearing alignment of the limb is restored. The restoration of normal limb mechanics and the removal and fusion of the diseased joints together provide for stability of weight-bearing and relief of pain. There is some loss of suppleness of the hindfoot experienced as difficulty accommodating to uneven ground compared to the normal foot. However, patients who

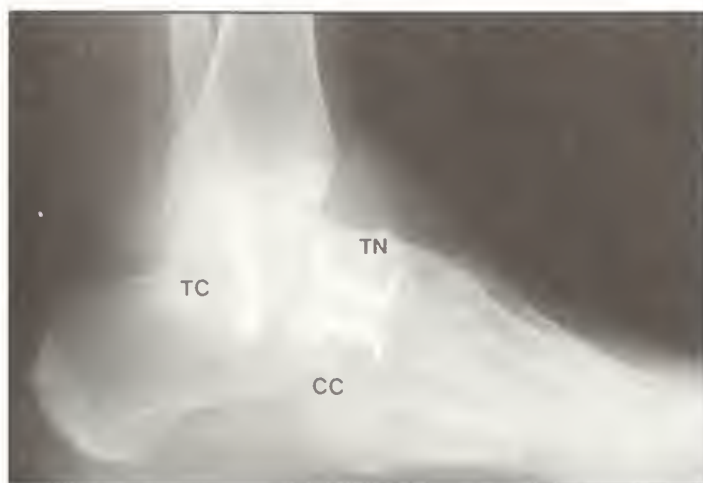


Fig 7.—Triple arthrodesis. Fusion of the talocalcaneal (TC), talonavicular (TN), and calcaneocuboid (CC) joints (screw anchors a tendon transfer).

undergo this procedure have already lost a significant amount of this ability because of the loss of range of motion and pain due to the primary disease process. The hindfoot stiffness is more than compensated for by the stability and pain relief. Both osteoarthritis and rheumatoid arthritis may affect one or more hindfoot or midfoot joints and isolated fusions are often quite useful in providing stability and pain relief (Figure 8). After arthrodesis of the ankle, hindfoot, or midfoot, patients are placed into a short leg cast and maintained non-weight bearing for 6 to 8 weeks and then converted to partial weight bearing until fusion is complete, usually by 12 weeks. Fusion rates approximate 85% to 95% with the subtalar joint and midfoot being somewhat more predictable than the ankle.

Rheumatoid arthritis commonly affects the forefoot and produces characteristic deformities. Ligamentous and capsular instability combined with muscle imbalance produce dorsal subluxation of the lateral toes and valgus angulation at the first metatarsophalangeal joint. Together with loss of the plantar fat pad these deformities lead to prominence of the metatarsal heads on the plantar surface and result in pain (metatarsalgia) with weight-bearing. Patients present with a very painful gait and, despite destructive changes in other joints, are often most incapacitated by pain at the metatarsal heads. Skin breakdown, including ulceration and infection, commonly occurs in response to excessive plantar



Fig 8.—Isolated midfoot and hindfoot arthrodeses. Left, talocalcaneal arthrodesis. Right, navicular cuneiform and calcaneocuboid arthrodesis.



pressure. Patients experience an enormous amount of pain relief and significant improvement in gait by metatarsal head resection and correction of toe deformities. Resection arthroplasty is performed of all five metatarsal heads with the interposition of a flexible (silicone) spacer or other device at the first metatarsophalangeal joint (Figure 9). This procedure shifts weight bearing posteriorly in the foot, relieving pain, and distributing pressure more evenly on the skin preventing skin breakdown. Cock-up or hammer toes are usually treated at the same time with extensor tendon release and fusion of the proximal interphalangeal joints. This relieves the toes of pressure from overlying shoes and completes the pain relief at the forefoot.



Fig 9.—Forefoot reconstruction in rheumatoid arthritis. Top left anteroposterior, top right, lateral. Characteristic forefoot deformity with dorsal dislocation of the toes and first metatarsophalangeal valgus and joint destruction. Bottom left, resection arthroplasty of metatarsal heads with interposition of a silicone hinged spacer at the first metatarsophalangeal joint (arrow). Resection of each lateral metatarsal head is successively shorter to maintain the physiologic distribution of weight bearing.

Shoulder Arthroplasty

The shoulder is a complex of joints comprised of the scapulohumeral, acromioclavicular, and glenohumeral articulations. Clinically, glenohumeral arthritis presents as pain with loss of range of motion. Shoulder arthroplasty is useful to decrease glenohumeral pain and to increase the functional range of motion. Particularly important in this regard is forward flexion and abduction or elevation. While humeral head implants are similar to hip replacement devices, total shoulder replacement (TSR) is really more of a resurfacing type arthroplasty similar to total knee replacement (Figure 10). Soft tissue balance and repair are important to the success of the reconstruction. The anatomy that allows the shoulder its large range of motion, namely minimal bony constraint and reliance for stability upon ligamentous, capsular and muscular tissue, predisposes the shoulder arthroplasty to instability when these structures are lax or to limitation in range of motion when they are scarred or contracted. Lysis of peri-articular adhesions and repair of the rotator cuff are essential to provide adequate motion and stability. The glenoid is not always resurfaced because fixation of the glenoid component is often marginal, and loosening of the glenoid component is common due to limitations in scapular bone stock. Since much of the articulation of the humeral head is with surrounding soft tissues rather than with the bony glenoid, pain relief is often adequate

with replacement of the humeral head alone, particularly with osteonecrosis. In rheumatoid arthritis, or osteoarthritis with eburnation of the glenoid, replacement of the glenoid may be carried out. As with most total joint arthroplasties, substantial improvement in pain should be expected.¹¹ The recovery of range of motion is quite variable and depends upon the extent of motion loss preoperatively, the soft tissues available at surgery for reconstruction, and the nature of the postoperative rehabilitation program.



Fig 10.—Total shoulder replacement. Total shoulder replacement with a stemmed resurfacing humeral component and polyethylene glenoid component (arrows).

The rehabilitation of the shoulder following TSR is extensive and requires patient commitment and compliance. Ninety degrees of forward flexion and abduction at the glenohumeral joint should be expected with additional motion provided by the scapulohumeral articulation. The most frequent mechanical complication is anterior dislocation of the humerus. The incidence is variable, depending in large part upon the soft tissues available for reconstruction and the positioning of the humeral component.

Not all patients with shoulder pain and arthritis require arthroplasty. Two relatively common problems at the shoulder can be confused, and may coexist, with glenohumeral arthritis: 1) acromioclavicular arthritis; and 2) peri-articular pain related to structures in the subacromial space. Acromioclavicular arthritis is usually tender upon direct palpation, and pain may be present on clavicular rotation with shoulder elevation. Radiographic examination may demonstrate osteophytes on the inferior surface of the acromioclavicular joint, which can irritate or abrade structures in the subacromial space. Resection arthroplasty of the acromioclavicular joint provides excellent pain relief in patients resistant to conservative therapy. The subacromial space lies between the inferior surface of the acromion and the acromioclavicular joint and the superior margin of the humeral head. It is occupied by the subacromial bursa and a portion of the rotator cuff. These structures are prone to inflammatory bursitis or tendonitis which may often be confused with glenohumeral pain. Impingement of these soft tissues beneath the acromion and acromioclavicular joint, especially with osteophytes, can be present with glenohumeral abduction. Attrition ruptures of the rotator cuff, usually the supraspinatus, may occur independently or as a part of the acromioclavicular or glenohumeral pathology in osteo or rheumatoid arthritis. Subacromial impingement and bursitis is treated by anterior resection acromioplasty which enlarges and decompresses the subacromial space. The rotator cuff insertion can be inspected and repaired at the same procedure.

Conclusions

Contemporary reconstructive orthopedic surgery can treat a wide variety of arthritic disabilities with efficacy and safety. These procedures improve function, maintain mobility, and preserve independence. They have been shown to be cost effective in preventing dependence on the health care system, home care, nursing homes, and other institutions.¹²

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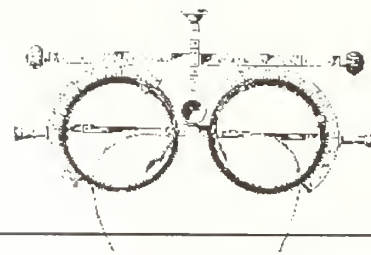
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Scurvy by Any Other Name: A Case Report

Joan Baumbach, MD, MPH

Groups (at great risk for scurvy) include older people living alone, young children eating exclusively cow's milk formula, food faddists, and those consuming inadequate diets for reasons such as mental illness or peptic ulcer.

Scurvy, or less severe states of hypovitaminosis C, may be more prevalent than many physicians recognize. Even today the classic findings of scurvy may be seen: hyperkeratotic hair follicles and corkscrew hairs, swollen spongy gums, petechiae, ecchymoses, purpura, brawny induration of calf and leg muscles, joint effusions, pain (particularly of legs), anorexia, lethargy, and weakness. Since frank scurvy can be mistaken for a wide range of other diseases, diagnosis is often delayed. Awareness of risk factors for scurvy is important today for diagnosing the disease.

Case Report

A 55-year-old divorced woman who had lived with her mother and stepfather for the past 8 years came to the Rhode Island Hospital Emergency Room because of swelling of both knees for 3 weeks. Two weeks before presentation her right thigh had become swollen and ecchymotic. She complained of pain in her right foot, which extended to the knee on exertion.

Ulcerative colitis had been diagnosed about 15 years earlier. She subsequently limited her dietary intake largely to pasta with no fruits, juices, or vegetables. Episodes of unilateral knee swelling similar to the presenting complaints had been attributed to gout, though synovial fluid had not been examined. She had *alopecia totalis* for 14 years. She acknowledged episodes of swollen gums with some bleeding associated with tooth-brushing for years as well as occasional epistaxis. In addition she noted "burst blood vessels" mostly on her legs for

the past 2 years.

Physical examination noted a well-developed woman with *alopecia totalis*. Vital signs were: temperature, 98.6°F; blood pressure, 160/80; pulse, 60 beats per minute; and respiratory rate, 12 per minute. Skin revealed petechiae of both lower extremities and less so of her arms and back. Ecchymoses of the right upper extremity were present. A large nonpalpable purpuric area over a very swollen, tense, right thigh was present. Bilateral knee effusions were noted associated with warmth, full range of motion but with no pain or tenderness, and absence of erythema. Heart rhythm was regular with no audible murmur or gallop. Lungs were clear to auscultation. Abdominal exam was unremarkable. Mild ankle and pretibial pitting edema of both lower extremities were present. Rectal examination was unremarkable, and stool was negative for occult blood. Neurologic examination revealed no abnormalities.

... one author stated that 41% of elderly hospitalized patients had evidence of vitamin C deficiency.

Laboratory data were: normal electrolyte values; hemoglobin, 9.5 gm/dl; mean corpuscular volume (MCV), 76 μ l; white blood count, 9,400 with a normal differential; and platelet count 366,000. Serum iron, 35 micrograms/dl; and ferritin, 39 ng/ml. Bleeding time was normal. Erythrocyte sedimentation rate was 43 mm per hour. Prothrombin time and partial thromboplastin time were both normal. Synovial fluid analysis revealed 75,870 red blood cells, 540 white blood cells per mm³ but no crystals. X-rays of the patient's knees revealed no bone or joint changes. Ultrasound of the right superficial femoral and popliteal veins revealed no deep venous thrombosis. Ascor-

bic acid level, not drawn until after 3 days of hospital diet, was 0.4 mg/dl (normal range at this hospital: 0.8-1.5 mg/dl).

The patient was begun on vitamin C supplementation of 500 mg per day in divided doses. Petechiae, ecchymoses, cutaneous hemorrhages, and hemarthroses resolved within 2 weeks.

Discussion

Though vitamin C deficiency has been documented among the elderly, particularly among those hospitalized or institutionalized,¹⁻³ frank scurvy is thought to be rare. However, several authors argue that the prevalence of hypovitaminosis C may be higher than thought.

Scurvy is caused by vitamin C deficiency, which leads to inadequate production of collagen. Scurvy will develop after 80 to 120 days of inadequate ascorbate intake. Vitamin C is water-soluble and the body cannot store it in large amounts. Thus the supply of ascorbic acid needs to be replenished frequently. Foods rich in vitamin C include citrus fruits, berries, broccoli, spinach, cabbage, and tomatoes. As capillaries become fragile from vitamin C deficiency, they produce ecchymoses, petechiae, swollen or bleeding gums, loose teeth, mucocutaneous bleeding, brawny induration of calf and leg muscles and ocular hemorrhages in the bulbar conjunctivae; these are associated with poor wound healing, weakness, lethargy, pallor, anorexia, limb and joint pain (especially in the knees), tender, painful swelling in the legs, fractures of the costochondral junctions of the ribs or epiphysis in small children, irritability, depression, and potentially death (see Table 1). With vitamin C replacement, symptoms usually subside in 2 to 3 days and hemorrhages and bone disorders resolve in 2 to 3 weeks. Recommendations for treatment of

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scurvy range from daily doses of 10 to 100 milligrams of vitamin C in mild disease to as high as 500 to 1000 milligrams in severe disease.

Scurvy as a disease has been known for hundreds of years though knowledge of its cause as a dietary deficiency was not clearly recognized until this century.

Early sea voyagers subsisted largely on salt pork, salt beef, and biscuits; and on long journeys they were ravaged by scurvy. By the late 16th century diagnosis and treatment of scurvy was known to some seafarers and physicians.^{6,7} However, it was not until 1747 that the Scottish physician James Lind, while in the British Navy, carried out experiments with patients severely ill from scurvy. In 1753 he wrote *A Treatise of Scurvy*, in which he described those experiments and urged that lime juice be issued to British sailors.⁸ After a period of controversy, this practice eradicated scurvy in the British navy.

In 1911 a Polish biochemist, Casimir Funk, working in the Lister Institute in London published his theory of "vitamines" suggesting that four substances present in natural food protect against four diseases: beriberi (deficiency of vitamin B1 or thiamine found where polished rice was the staple food), pellagra (niacin deficiency), rickets (vitamin D deficiency), and scurvy (deficiency of vitamin C or ascorbic acid).⁹ At that time the 11th Edition of the *Encyclopaedia Britannica* (1911) stated that the incidence of scurvy depended upon the nature of the food but that it was disputed whether the cause was the absence of certain constituents in food or the presence of a poison.

Szent-Gyorgi in 1928 was the first to obtain the pure vitamin though he did not know at first that it was vitamin C. In 1933, Parsons became the first physician to describe infantile scurvy, cured by ascorbic acid (and obtained from Szent-Gyorgi).¹⁰

The role of ascorbic acid in collagen formation and iron absorption is well-accepted; however, its roles in oxidation-reduction reactions, steroidal synthesis, and

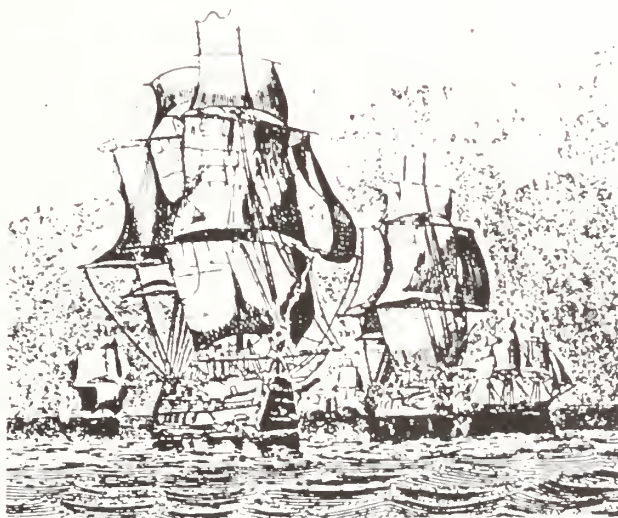
tyrosine metabolism remain less well defined and its potential roles in drug, folate, cyclic nucleotide, amino acid, glucose, cholesterol, and carnitine metabolism, in leukocyte function, and in interferon production are currently being investigated.¹¹

During the 1940s and 1950s adult scurvy was regarded as a rarity, though Cutforth did describe one cohort of patients in 1958.¹² During the 1960s, however, vitamin C deficiency was thought to be more prevalent than described earlier. In 1966, one author stated that 41% of elderly hospitalized patients had evidence of vitamin C deficiency.¹³ The metabolism of vitamin C, symptoms of scurvy, and dietary requirements preventing scurvy were evaluated during the late 1960s and early 1970s.¹⁴⁻¹⁶

Controversy exists about ascorbic acid requirements beyond the small amount needed to prevent

scurvy (approximately 10 mg/day). In 1987, Mandal and Ray found a 40% prevalence of vitamin C deficiency among 277 patients admitted for evaluation in a geriatric ward.¹⁷ Cheraskin suggests that hypovitaminosis C is high among institutionalized as well as healthy individuals depending on the test and standards for normality used.¹⁸

Ascorbic acid nutritional status is usually based on concentration of the vitamin in serum or plasma. Serum ascorbic acid levels less than 0.2 mg/dl and leukocyte ascorbic acid levels less than 30 mg/dl help to confirm the diagnosis when dietary history reveals inadequate intake of vitamin C. The level of 0.4 mg/dl in our patient does not rule out scurvy since she had been eating a hospital diet for several days before her level was measured. The patient response to 500 milligrams of ascorbic acid per day is strong presumptive evidence for the diagnosis. Increased awareness of the signs and symptoms of vitamin C deficiency particularly among the very young, the elderly (particularly institutionalized), or anyone on restricted diets might help to reduce the incidence of clinical or subclinical scurvy.



Summary and Conclusion

Scurvy can mimic disorders such as vasculitis, systemic bleeding disorders, and deep vein thrombosis. For this reason scorbutic patients are often evaluated for other disorders thus delaying the correct diagnosis. Health care providers may be able to prevent cases of scurvy with knowledge of the clinical features of scurvy and higher levels of suspicion of high risk groups. These groups include older people living alone, young children eating exclusively cow's milk formula, food faddists, and those consuming inadequate diets for reasons such as mental illness or peptic ulcer.

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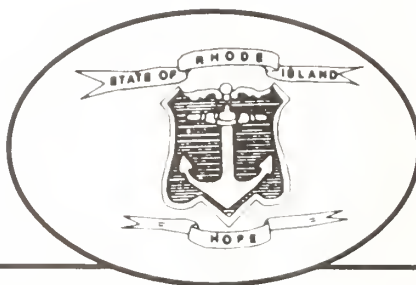
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HEALTH BY NUMBERS



Rhode Island
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Director of Health

Trends and Patterns in Health Risk Behaviors

Personal behaviors have been shown to be significant in determining risk for many chronic diseases and injuries. The Rhode Island Department of Health has surveyed a sample of Rhode Island adults by telephone during each year since 1984 to track rates for key health risk behaviors among the state's population. The survey is part of the national Behavioral Risk Factor Surveillance System (BRFSS), funded by the Centers for Disease Control and Prevention (CDC), in which 48 states and the District of Columbia currently participate.¹ In 1992, the Rhode Island survey included 1,808 randomly selected persons ages 18 and older living in households with telephones.

Over the 5 years from 1988 to 1992, for which comparable risk factor data are available, Rhode Island has experienced both decreases and increases in the proportions of persons who engage in seven key behaviors that put them at risk of poor health or injury (Table 1). Improvements have been seen in the areas of exercise, safety belt use, and smoking; growing problems include overweight, binge drinking, and drinking and driving. The greatest rate of improvement has been in the proportion of persons exercising regularly at the minimum level needed for long-term cardiovascular health.

Compared to data from other states participating in the BRFSS,² Rhode Island rates that are particularly high relative to the median state rates include non-use of safety belts and chronic drinking; for both behaviors, local rates are about double the state medians and fall among the top five rates reported for all states (Figure 1). A pattern of risk in the state is seen in the three alcohol-related behaviors, all of which are relatively common among Rhode Islanders. The state's rates for these behaviors place it among the top one-quarter of states for each risk factor.

The state's population is among the lowest of all states for sedentary lifestyle and overweight. The number of sedentary persons in the state has fallen far more rapidly

than in other states, whereas the overweight proportion has been increasing in much the same way as elsewhere (Table 1). Overall, Rhode Islanders are relatively more at risk than the median state from four of the seven risk behaviors examined, including the alcohol-related behaviors, and less at risk from two behaviors.

Within the state's population, certain groups defined by age and sex exhibit elevated patterns of risk factor behavior. Based

on the seven key behaviors examined, the group currently most at risk are males ages 45 to 54 years. (The age groups investigated for both males and females are, in years, 18-24, 25-34, 35-44, 45-64, 55-64, 65-74, and 75 and older.) This group was found to be at elevated risk for six of the seven behaviors relative to the rates for the entire population (Figure 2). For four of the seven behaviors, including safety belt non-use, sedentary lifestyle, current smoking, and chronic drink-

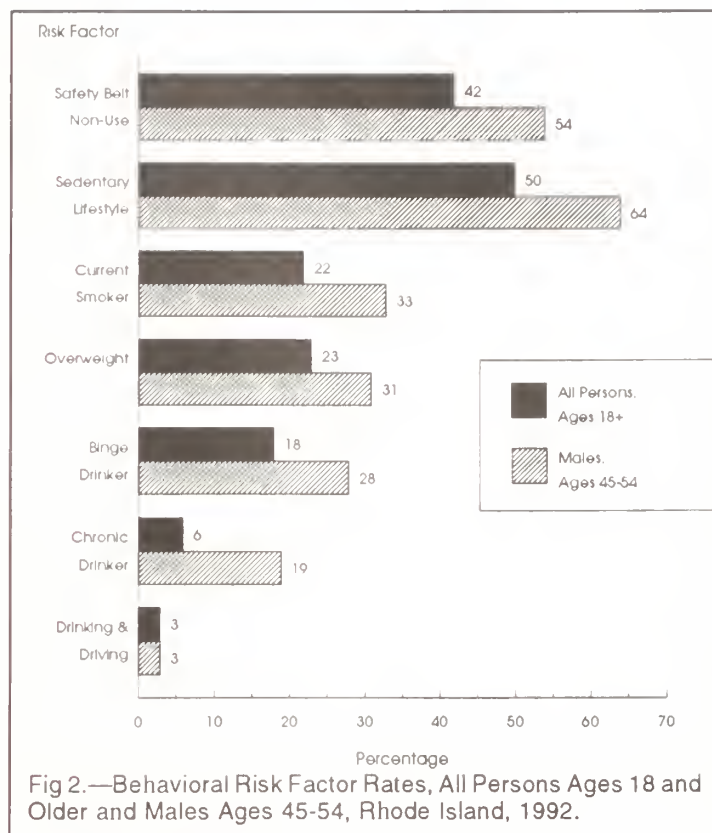
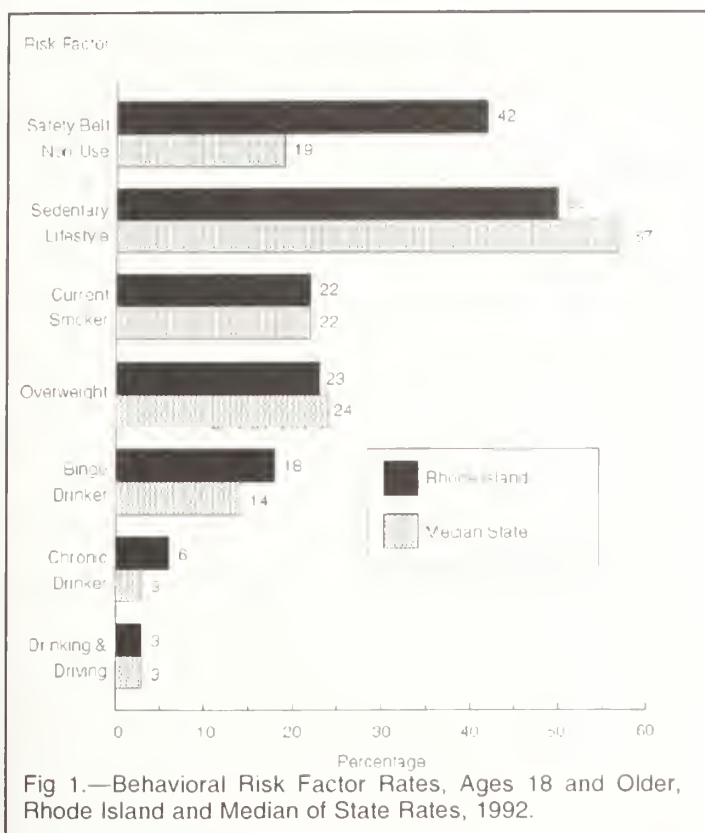
Table 1.—Percentage of Persons Ages 18 and Older Reporting Selected Risk Factors, Rhode Island and Median of Participating States*, 1988 and 1992.

Risk Factor**	Area	Year	
		1988	1992
Safety Belt Non-Use:	Rhode Island	47.0	42.2
	Median State	30.1	19.3
Sedentary Lifestyle:	Rhode Island	64.8	50.2
	Median State	58.0	56.5
Current Smoker:	Rhode Island	24.3	22.2
	Median State	24.3	22.2
Overweight:	Rhode Island	18.2	23.1
	Median State	20.9	24.4
Binge Drinking:	Rhode Island	15.0	17.8
	Median State	15.4	14.3
Chronic Drinking:	Rhode Island	5.8	5.5
	Median State	5.8	2.9
Drinking and Driving:	Rhode Island	2.6	3.1
	Median State	3.2	3.3

* In 1988, 36 states and the District of Columbia participated in the Behavioral Risk Factor Surveillance System (BRFSS). In 1992, 48 states and the District of Columbia participated.

** Risk factors are defined as follows:

Safety Belt Non-Use: Sometimes, seldom, or never uses safety belts.
Sedentary Lifestyle: Exercises less than 20 minutes per day and/or less than 3 days per week.
Overweight: Body-mass index 27.3 for females, 27.8 for males.
Current Smoker: Ever smoked 100 cigarettes and smokes regularly now.
Binge Drinking: Five or more drinks on an occasion during past month.
Chronic Drinking: Averages 60 or more alcoholic drinks per month.
Drinking and Driving: Drove after having too much to drink during past month.



ing, the rate for males ages 45-54 was the highest or second highest of any group.

These survey data, collected consistently over time and across geographic boundaries, provide direction to programs in Rhode Island to modify health risk behaviors and prevent chronic disease and injury. Analysis for trends reveals behaviors in which the state's population is showing improvement, such as in exercise rates recently. The data

allow for comparison to risk factor rates and progress over time in other locales, helping identify specific local problems, such as alcohol-related behaviors. The identification of particular population sub-groups, by age, sex, race, education, income, and other descriptive items, assist program staff in designing and targeting their efforts. Finally, the information can be applied to the evaluation of behavior-change programs

when collected over the lifetime of the programs.

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Images and Patterns in Medicine

Edited by Edward Feller, MD

A 34-year-old patient comes to an emergency room complaining of a 1-day history of fever and the acute onset of difficulty swallowing.

(For interpretation and comment, see Page 32.)



THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (January 1904)

The lead article, an original communication by William H. Peters, MD, is entitled "The Winter Quarters at Pine Ridge Camp" and contains a description of the isolated tent camp in Foster, established by the state of Rhode Island to manage consumptives. The camp was begun during the prior summer and provided modest living quarters for 20 patients. The approach of winter required housing more substantial than canvas tents. Accordingly, cabins were constructed at the cost, each, of \$150. The remainder of the article describes a typical day in camp and the schedule for its patients. The article concludes with a cordial invitation to Rhode Island physicians to inspect these facilities.

An article entitled "Remarks on Specimens Illustrating Certain Forms of Arterial Disease" is offered by Frank T. Fulton, MD, pathologist to Rhode Island Hospital. A series of diseased aortas, hearts and kidneys, with clinical pathological correlations, is presented.

Arthur Hollingworth, MD, offers a paper on the anatomic variations of the human appendix. A classification of appendiceal positioning is presented, particularly in its relation to the cecum, the ileocecal fossa and the retroperitoneal space. A review of 102 autopsies from the records at the Rhode Island Hospital furnishes a numeric distribution of the various appendiceal positions. The author's point is that it is naïve for the surgeon to anticipate that all appendices will assume the same anterior-superior position.

This issue of the Journal contains an editorial advocating revisions in the bylaws and constitution of the Rhode Island Medical Society. "The plan proposes to enroll as members . . . every legally qualified physician in the State who is a member of a district society, upon payment of a nominal

yearly fee . . . and opportunity shall be given every reputable and legally registered physician who does not practice or claim to practice nor lend his support to any exclusive system of medicine." The 13 Rhode Island physicians who died in the prior year are listed. (The average age at death was 66.7 years.)

50 Years Ago (January 1944)

Emery M. Porter, MD, contributes the lead article, a paper entitled "Planning for Security." The author urges the creation of a statewide nonpartisan voluntary council to survey the medical and health facilities of the state leading to a body of recommendations for the state *without the utilization of federal funds*. The author concludes by expressing the hope that this council would eventually go beyond mere advising and be instrumental in the creation of a health care program unique to the needs of Rhode Island.

The address by Governor J. Howard McGrath to the General Assembly, January 4, 1944, concerning compulsory hospitalization insurance is summarized.

The editor, Peter Pineo Chase, MD, accepts a broadened mission for the Journal in becoming the official publication, also, of the Rhode Island State Dental Society. Accordingly, a new section of the Journal is now devoted to the technical, professional and social problems of clinical dentistry.

News items concerning Rhode Island physicians on overseas military duty are presented by Captain Irving Beck. "Grand Rounds," held in some undisclosed jungle, are vividly described.

The Society's Committee on Maternal Mortality presents a summary of its findings with two illustrative case histories, one of a 23-year-old woman, post-partum, who died of bulbar paralysis; and the second, a 31-year-old multiparous woman who died

postpartum. Her final diagnosis was toxemia of pregnancy and chronic pyelonephritis.

25 Years Ago (January 1969)

B. Cairbre McCann, MD, writes on post-stroke rehabilitation, quoting (but not totally disagreeing with) the aphorism that rehabilitation begins when Blue Cross ends. The operative philosophy of medical rehabilitation is reviewed as well as the categories of information needed before an educated assessment may be offered. Treatment methods are discussed as well as the problems of ambulation, bracing and the social and psychological dimensions of assisted recovery.

George A. Bray, MD describes recent advances in the problem of obesity, beginning first with its pathogenesis and effectiveness of dietary therapies in its treatment. Metabolic obesity, and its therapies, are separately considered.

This issue of the Journal highlights the actions taken by the House of Delegates of the American Medical Association in its Miami Beach meeting of December 1968.

Henry M. Litchman, MD, describes workmen's compensation medicine, noting that psychological problems as well as motivation are often materially influenced by third-party payment.

A pilot health education program outlining the hazards of cigarette smoking is summarized by Murial Sadler.

An editorial takes note of the centennial of the birth of Karl Landsteiner, MD, Nobel Laureate (for his discovery of the human blood types) and a scientist with ties to the Rhode Island community. The editorial quotes William James: "The great use of life is to spend it for something that outlasts it."

The necrology of Rhode Island physicians notes, with sadness, the passing of 14 colleagues during 1968. The average age at death was 66.0 years.

Rhode Island **MEDICINE**

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The Brown University AIDS Program, with the assistance of the New England AIDS Education and Training Center, is sponsoring a program to train primary care providers in issues surrounding AIDS and human immunodeficiency virus (HIV) infection. Our goal is to facilitate comfort in the evaluation and management of individuals with HIV infection, and to increase knowledge of resources available for appropriate triage.

Topics to be covered include:

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- Antiretroviral and other Therapies
- Clinical Management of the HIV-Infected Patient
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Images and Patterns in Medicine

Interpretation and Comment

(cf Page 27)

RETROPHARYNGEAL ABSCESS

A single lateral radiograph demonstrates widening of the retropharyngeal soft tissues. An air-fluid level projects anterior to C3-4. Soft tissue air is seen tracking in the pharyngeal soft tissues.

Retropharyngeal abscess is most common in infants and young children, being rare after age 10. Infection may be due to contiguous spread or from local lymphatic involvement. In adults, such abscesses may result from trauma or be secondary to a middle ear or parotid infection. The diagnosis may be suggested by the acute onset and confirmed by palpation of the posterior pharyngeal wall. The abscess has a fluctuant, boggy texture. In addition, the cervical-vertebral bodies posterior to this space can not be palpated. Prompt recognition and treatment with antibiotics and surgical drainage may avoid potential complications of spontaneous rupture into the airway with asphyxiation, laryngeal spasm, bronchial erosion and thrombosis of the jugular vein.

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Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalamic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it, however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon[®] is indicated as a sympatholytic and mydriatic. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.^{1,2} Also dizziness, headache, skin flushing reported when used orally.^{1,3}

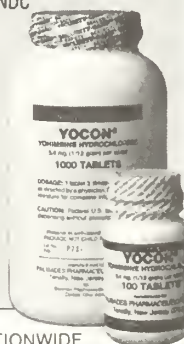
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.^{1,3,4} 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.³

How Supplied: Oral tablets of Yocon[®] 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

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1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
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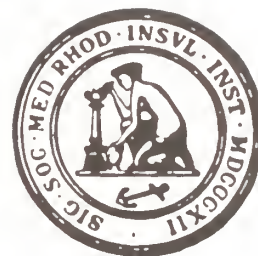
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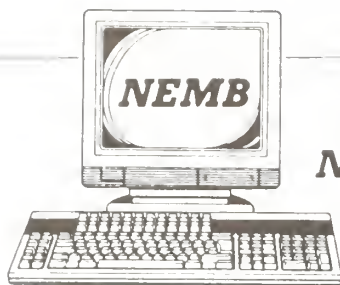
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A Century of Poliomyelitis

As years go, 1894 was not a very memorable one: Grover Cleveland was in the midst of his second term, Victoria still ruled an empire that had yet to see the setting sun, Dreyfus was convicted of treason by a French military tribunal, Roentgen completed his X-ray generating apparatus, and the United States experienced its first epidemic of poliomyelitis, then called acute paralysis or Heine-Medin disease. The current year, 1994, thus represents the centennial of this grim event.

No credible descriptions of acute flaccid spinal paralysis in childhood are known to exist before Heine's 1840 article. During the succeeding five decades an increasing number of papers dealing with this disorder appeared, culminating in Medin's meticulous study of the 1887 epidemic in Stockholm, the first known clustering of cases, 73 in number, and the first assemblage of epidemiologic evidence that poliomyelitis was communicable. Until that time, virtually all the known cases had been sporadic and confined, curiously, to the cities of Scandinavia, western Germany and France. A filterable agent capable of serially reproducing the disease in rhesus monkeys finally was identified by Landsteiner and Popper in 1908 and by Flexner in 1909.

During the summer of 1894, for the first time in North America, two paralytic outbreaks were recorded: one in Brooklyn and one in Rutland County, Vermont. The latter, comprising 123 cases, was carefully documented by Charles S. Caverly, MD. He observed that the great majority of the affected children lived in valley communities centered on a sewage-contaminated waterway, Otter Creek. He noted, too, that among those visibly affected, "the strong, healthy children preponderated." Caverly's initial contact with poliomyelitis evolved into a lifelong commitment to public health. He subsequently rose to become Vermont's Director of Health and an international au-

thority on poliomyelitis. Following the 1894 American epidemic, there were subsequent major outbreaks in 1907, 1912 and 1916 although minor clusterings continued in virtually every intervening year. Most of these major outbreaks were confined to the larger cities of the Northeast, particularly New York City. Males were more commonly affected than females, and while cases were rare in persons older than 21 the case fatality rate rose with age. Cases often were clustered geographically, the disease distribution following lines of human traffic, although no person-to-person pattern could be discerned. Infantile paralysis, another name for poliomyelitis, was described as infectious but not contagious.

Therapy, then, was admittedly palliative and the only public health measures available were selective quarantine, urban and personal sanitation, and insect control. None of these public health interventions had any palpable effect upon the length, distribution or severity of the outbreaks.

Selective quarantine, activated during summer months, consisted of barring children from those public facilities where they might have extended physical contact with each other (eg, swimming pools, athletic contests, Sunday School, theaters, gymnasiums). Prior public health experience in England and Germany during the 19th century scourges of diseases such as typhoid, cholera and typhus evolved into a sanitarian perspective of infectious disease requiring, without a preventive vaccine or a curative agent, scrupulous attention to personal and communal cleanliness. London began to sprinkle its streets daily with a chlorinated lime solution and most western cities followed suit. Indeed, street washing as a sanitary rather than esthetic measure persisted in this country until the middle of this century. The 19th century epidemiologic studies of yellow fever and malaria suggested that poliomyelitis might similarly be transmitted by a vector such as an insect. Without objective evidence, the house fly was

quickly indicted and the United States then undertook an ineffectual national campaign to exterminate the fly. These various sanitary measures were adopted because of the tacit assumption that the virus was transmitted by flies, by air, or by direct contact and that the principal mechanism for infection was by "kissing, touching, coughing and sneezing." The fear of polio infection by contact led to such radical measures as the burning of public library books found in the homes of verified cases. At the height of the 1916 east coast epidemic, about 350 cats and dogs were killed per day, pets abandoned to the Humane Society because they were thought to be vectors of poliomyelitis. None of these energetic measures worked—largely because the true means of spread had not been appreciated.

Rhode Island, during the 1916 epidemic, was one of four states adopting travel restrictions during those anxious summer months. Since most states identified New York as the source of the infection, these four states banned entry by children from New York, unless they carried a Department of Health certificate attesting to their health and freedom from polio in their immediate family. In Pennsylvania, health officers were also given police powers to inspect homes without the need for warrant and to arrest families harboring children with flaccid paralysis. Health officials were authorized "... to ferret out the sick, the unclean, the ignorant and the irresponsible ones."

The 19th century experience with tuberculosis, cholera and typhoid taught public health officials the dismal lesson that both the victims and the carriers of these gothic illnesses were most commonly the poor and the displaced. Successions of 19th and early 20th century immigrants were blamed for bringing Old World diseases to these shores. When an eminent socialite died of poliomyelitis in 1916, The New York Times reported the event in perplexed terms: "... she lived in surroundings inimical to the exist-

ence of paralysis germs yet she contracted the plague." Another newspaper finally clarified the paradox by noting that the household of this victim had employed a Polish immigrant maid who "undoubtedly was the one who spread the germs."

The statistical relationship between poverty and tuberculosis, for example, was indisputable. But when epidemiologists began the task of collating data on poliomyelitis, a number of disquieting and unresolved contradictions emerged. First, polio was a summer disease, while most of the respiratory infections peaked during cold weather; second, there was rarely more than one polio case per household, in sharp contrast to the experience with tuberculosis; third, the majority of polio cases involved well-nourished children living in stable, middle-class homes. During the 1916 epidemic, for example, black children living in the urban ghettos appeared to be quite immune. Among the 21,000 orphans in New York, there were but 10 cases of polio. (If the general incidence rate recorded in New York had prevailed with this institutionalized group, there should have been at least 260 cases of paralysis.) Yet another study running contrary to expectation showed an inverse relationship between infant mortality rates and poliomyelitis rates. Polio, despite anticipations otherwise, turned out to be an infectious disorder of the healthy, well nourished, physically active, economically stable, native-born population.

Only decades later, when the pathogenesis of polio was clarified as an enteric rather than respiratory infection, did some of these mysteries unravel. This infection, transmitted largely through contaminated drinking water, was indeed more common in the poor and displaced; but these impoverished young were typically infected during their infancy, resulting in a transitory diarrhea only, followed then by a lifelong immunity. On the other hand, those children from middle-class families with access to clean drinking water, might not encounter the poliovirus until later in their childhood, at which time the possibility of viremic spread to the brain and spinal cord became substantially greater. It was estimated that well over 95% of infections progressed no further than a moderate diarrhea. Paralysis, then, was a rare event ensuing only when a local enteric infection in an ambulatory child was transformed into a viremia (with nervous system seeding) because of some superimposed risk factor such as trauma or acute physical stress. By making the paralysis the defining feature of a widespread, essentially diarrheic, disease the ubiquity of this nonparalytic disorder was obscured. In

regions with contaminated water supplies, the entire newborn population underwent an unplanned, "natural" oral-route immunization, thus aborting any clinical poliomyelitis. Paralytic poliomyelitis thus evolved as one of the unintended burdens of improved urban life.

In the 1950s the factors converting a local viral diarrhea to a disseminated viremia (with nervous system involvement) were carefully explored. Experimental models were established based on some anecdotal evidence suggesting: 1) that young people undergoing excessive physical exertion were often the ones to develop paralytic signs; while 2) those children who were physically handicapped or bedridden (eg, those with muscular dystrophy) almost never succumbed to paralytic poliomyelitis. The Syrian hamster inoculated parenterally with polio virus did not develop clinical or pathological signs of motor paralysis; if, however, these animals were subjected to great physical exertion, a number would then display flaccid paralysis. Narrowing it further, investigators demonstrated that a parenteral injection of a small dose of cortisone converted a covert polio infection into a rapidly advancing and fatal quadriplegia.

The Expanded Program on Immunization in the Americas (EPI) has maintained a surveillance program for paralytic poliomyelitis throughout the Americas. By 1990, after massive vaccination campaigns, there remained only 12 new cases (in Mexico, Guatemala, Colombia, Ecuador and Peru). In 1991 the number of cases was reduced to 7 (Colombia and Peru). And the last known case, in August 1991, was a child living in Pichanqui, Peru. During the remainder of 1991 and into 1992, the Peruvian Ministry of Health visited 2,103,201 households in the provinces surrounding Pichanqui and provided vaccination for 1,920,414 children younger than 5 years. Since August 1991, there has been no apparent transmission of indigenous wild poliovirus in Peru—or any other nation of the Western Hemisphere except for an isolated, and contained, episode in Canada. In late 1992 there had been an outbreak of poliomyelitis in the Netherlands within a small religious community that generally opposes vaccination. This sect maintained close contact with coreligionists in Alberta, Canada. Wild poliovirus (identical to the strain isolated from the Netherlands cluster) was found in stool specimens from 21 of the Canadian sect children; none of these children, however, showed paralysis. In a world of increasing mobility—voluntary or not—this episode documents the ease with which the virus

can be reintroduced into a community previously demonstrated to be free of poliovirus.

Health authorities cautiously believe that polio has now been eradicated in this hemisphere, although the possibility of viral reintroduction from Europe, Asia or Africa requires that a constant vigilance be maintained for cases of acute flaccid paralysis. Only a seamless global eradication will bar the possibility of any new reintroduction. It is now 100 years since polio as a public health menace arose in the United States and 29 months since this hemisphere has been freed of paralytic poliomyelitis. (In very rare instances, the modified live virus of the Sabin vaccine may generate a non-communicable paralysis when given to an immunodeficient person.)

What mental image does poliomyelitis generate? To those over 60, it recalls the constant specter of summer-based epidemics of infantile paralysis, the iron lung, the March of Dimes, and a president paralyzed by the disease; those hovering about 40 will remember the shadow of poliomyelitis retreating before new vaccines developed by Salk and Sabin; to those below 20, with no contemporaries suffering from the disease, polio is but an even more remote name given to a childhood vaccine. And when poliomyelitis eradication becomes global, then those soon to be born will know polio only as a companion to smallpox—two diseases enduringly removed as threats to mankind.

In an 1806 letter to Edward Jenner, discoverer of the smallpox vaccine, Thomas Jefferson wrote: "Future nations will know by history only that the loathsome smallpox has existed and by you has been extirpated."

Stanley M. Aronson, MD

Unbidden Messages

Handwriting on the wall may vary from fateful prophecy to pornographic graffiti. The Bible furnishes an example of the first kind (see Daniel 5:24), and the vandalized walls of most public places, the second kind.

To a scholar of graffiti, the washroom walls provide the greatest source of raw text material although the walls of telephone booths are not without some research value. Random samplings of such inscriptions reveal remarkably few expressions that touch either upon health delivery or the medical profession. Not many privy philosophers, apparently, can extract humor out of disease or the delivery of health care. Yet, here or there, one does encounter some tilt to-

ward medicine, particularly on the enclosed walls of hospitals and medical schools where the physician sometimes merges with the metaphysician. Among those written commentaries, taken from local sites, a sort of mural index medicus, the following have been chosen which have some enduring merit:

Hippocrates says: *Ars longa, vita herring . . .*
Free Galen . . .
Be kind to society's deprived, take a surgeon to lunch . . .
Take LSD and see . . .
Reality is for people who can't live with drugs . . .
Vesalius sleeps with a night-light . . .
If you can keep your head during a pharmacology exam, while those about you are losing theirs, perhaps you have misread the questions . . .
I want to be what I was when I wanted to be what I am now . . .
Carheters suck . . .
My mother made me an ophthalmologist (and scribbled below this: If I sent her some wool, do you think that she would make me one?)
Education is what you get from reading the small print; experience is what you

get from not reading it.

First Law of Inheritance: If your parents didn't have kids, you probably won't.
People in committees generally agree on things which, as individuals, they know to be idiotic.

Physicians come in three types: Those who make things happen; those who watch things happen; and those who wonder—what happened?

Freud's third rule: don't ever confuse movement with progress.
Abolish anatomy!!

Many of these medically oriented bits of graffiti are clever. But what of those scribbled in public places? What makes them distinguishable? What are their characteristics? They tend to be brief, hastily written, cogent, often acerbic, presenting (more often than not) some astigmatic, minority point of view. Frequently they are bitter; often, they offer a plea, a hope, an injunction or a feeling of shared remorse, sadness or failure. In style, they resemble more the fatalisms of a prisoner's message than the reflections of a philosopher. There is, indeed, something quite poignant about many graffiti messages: they offer no obvious benefit to their author; no royalties; no guarantee

even of an audience. Their message lasts but a brief time and is then forgotten, crossed out or erased. A rare graffiti message may become immortal, even defining an era (eg, "Gilroy was here") but the destiny of most can be measured in days or weeks. Some, such as those preserved in this commentary, rise above the usual expressions of ungrammatical hostility and somehow distill humor out of banality.

Why, then, bother to record this vandalism called graffiti? After all, obscenity is obscenity; but even the study of obscenity can be of some value. Sociologists tell us that graffiti is a kind of primal cry of the disadvantaged translated to a written statement. Most examples of present-day graffiti are barely readable expressions of anger or incomprehensible logos desecrating public walls; of those few that convey legible messages, most descend to depths of depravity; but some, perhaps very few, ascend to heights of poetry, whimsy or fantasy. But these lofty ones are truly rare: and it requires someone with sustained polyuria to find them.

Stanley M. Aronson, MD

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Valuation of Physician Practices

Complimentary copy of my memorandum regarding a recent conference on this issue sponsored by the *New York State Society of CPAs*, is available upon request. The meeting focused on the valuation of health care practices given the current regulatory and legislative uncertainties.

To receive your **complimentary** copy please call or fax the numbers listed above.

Both Physicians and Patients Have Right to Say Yes or No

To the Editor:

In his article in your December issue, Prof. Dan Brock maintains that a physician kills a patient when she removes that patient from life-sustaining treatment, since it is sophistry to distinguish her action from that of a hostile son who kills his mother by removing the same life-sustaining treatment. The physician may be acting with the patient's consent and with a license to practice medicine, but she is still killing the patient, not euphemistically "allowing (her) to die." Since society allows patients to decide about terminating life-sustaining treatment, thus giving doctors permission to kill, society should also allow patients to give doctors permission to use other means of killing (lethal injection, for example). Brock indicates that both terminating life-sustaining treatment and voluntary euthanasia are based on the same two ethical principles of individual self-determination and individual well-being.

It seems to me that Brock's example of the son who kills his mother and the two values that he has identified are not adequate to describe what takes place when a physician terminates life-sustaining treatment, let alone to support his argument for euthanasia. I would like to offer some related examples to show what I mean.

Suppose that an elderly woman presents to the emergency room in respiratory failure from pneumonia complicating chronic lung disease. She is placed on a respirator and antibiotics and regains enough strength to communicate in writing that she wants to be removed from the respirator. Her prognosis for ultimate recovery and return to independent living are good, but she is still in significant respiratory failure and will die if she is taken off the respirator at this time. Her son confirms that she has expressed the desire never to be put on a respirator. The attending physician determines in consultation with the hospital ethics committee that the patient is making a competent decision and removes her from the respirator. The woman signs out of the hospital against medical advice, goes home with her son and dies within 24 hours. Has the woman committed suicide? I tend to think not. Has the son or the physician killed the woman in this case? Again, I think not. Yet they have consented the removal of the respirator, death resulting, as in Brock's examples.

Consider the situation, typified by Karen

Ann Quinlan, in which a physician removes the respirator and the patient lives. If the physician continues to care for this patient, doesn't she reveal the non-lethal intent of her terminating life-sustaining treatment? What if a hostile son did the removing and his mother lived? Is his action the same as the doctor's? Are both attempted killing? Does it matter whether the son finds a way to finish the job? Whatever the answer to these questions, the decision to terminate life-sustaining treatment, since the patient may not die, is separate from the decision to kill the patient.

If we are to answer these questions, however, we will need to introduce other values than individual self-determination and individual well-being that Brock uses in his analysis. Euthanasia, like the practice of medicine, takes place in a social context, ie, involves two or more people, and individualistic principles are insufficient to describe or analyze the actions within this context. To step outside the medical frame of reference for a moment, who would say that one spouse's set of values is the last word in a marriage?

It seems to me that both the physician and the patient have the right to say "yes" or "no" throughout the duration of their relationship. The patient's right to say "no" takes priority over the others in this matrix. The woman with pneumonia who wants to terminate treatment can terminate treatment, and the physician is obliged to terminate treatment whether or not she agrees. For purposes of argument, I am talking about a

competent who does not pose a public health risk. Any action or treatment proposed by the physician should meet with the ongoing consent of the patient.

On the other hand, patients may make requests to which physicians say "no." When the patient decides that life is not a central good, but rather a "burden," "no longer wanted," "worse than no further life," "robbed of dignity," causing loss of control "over their care and circumstances of dying," the physician may acknowledge and sympathize with the patient's judgment, but she does not have to concur. If the patient finds life a burden, does it follow that the physician or society is obligated to find the patient a burden or to relieve the burden by killing the patient?

When a physician removes someone from life-sustaining treatment, she is evaluating a treatment, albeit in the context of a patient's life, but she is not automatically placing restricted value on that life or saying that the patient *must* die. The physician may witness the end of life without judging it. When the physician, with society's approval, agrees to kill a patient, to finish the job, she and society are making a separate value judgment of this patient's life taken as a whole. This judgment is made in both voluntary and involuntary euthanasia. Its significance is implied by Brock's caveats about involuntary euthanasia, but it is precisely this judgment that Brock has not adequately addressed.

James McIlwain points out as much in his comments on Brock's article but fears

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that the coercive nature of moral absolutes and religious fundamentalism undermines the interest of society in restricting euthanasia. And maybe we should fear euthanasia as the next great hope of the technological fundamentalists among us (if we can't cure you, we can still kill you), but maybe terms like benchmark or precedent are more suitable to civil debate than fundamentalism, whether of the secular, scientific or religious variety. His argument (my paraphrase) that society may say to the person requesting euthanasia, "Sorry, but the implications of killing you are so momentous for the multitude of living individuals that our concern for our collective welfare must take precedence over carrying out your wish," seems like a good benchmark to me.

Patrick R. Daly, MD
Narragansett, RI

took it upon himself to yield to the request of a patient, and injected a lethal substance, mercy in mind. As doctors and the public became more accustomed to the practice, their attitudes changed, and killing became easier and more acceptable. Today the procedure is no longer voluntary, and those lacking a certain "quality of life" are dispatched—elderly (at the request of their children), children with deformities, mentally deficient, etc., essentially those who are considered a burden to society. Of course this situation is not new. Before and during the Nazi era, the philosophy of *lebensunwertes leben* (life unworthy of life) was promulgated, the institutions were emptied, and we all know the horror that ensued. Again, doctors and the public became used to taking lives.

Dr Hamolsky was quite correct when he

associated euthanasia and abortion. Both embody moral relativism and involve the taking of a human life. Both also involve the abrogation of the age-old Hippocratic Oath, which has guided medical ethics for centuries. This was routinely taken by medical graduates until recently "I will give no deadly medicine to anyone if asked, nor suggest such counsel; furthermore I will not give to a woman an instrument to produce an abortion."

Doctors cannot be both healers and killers; they have a sacred trust to "do no harm." Once they change their role, the physician-patient relationship, so important for the practice of medicine and the healing process, is gone. Doctors must not kill!

John A. Roque, MD
Saunderstown, RI

Doctors Cannot Be Both Healers And Killers

To the Editor:

I am responding to the invitation to submit comments re the recent "Euthanasia" series of the RHODE ISLAND MEDICINE.

It has been said that euthanasia will supplant abortion as the principal focus of medical ethics, and this well may be so. Having practiced in suburban Providence as a solo internist for more than 35 years, my perspective is different from the authors with largely academic backgrounds. During this period, it was my privilege to serve many people for a long time, with the development of a trusting relationship, usual under these circumstances. Suffering, grief, tears, laughter and joy, cures, failures, death (natural)—all were part of this most gratifying experience. Pain was addressed with easily available narcotics and, I hope, a sympathetic and caring manner. Somehow, I do not believe this trust would be present if my patients felt that I might believe it was my prerogative to take their lives. Throughout the years, physicians have been healers, not killers. To transform this role is to negate their very purpose. The Netherlands scenario was mentioned. There we have seen the transformation of an attitude of trust replaced with one of suspicion and foreboding as patients, especially the elderly, are reluctant to enter the hospital, or otherwise submit to the care of a physician. The "slippery slope" certainly is personified in that country. Initially, an occasional physician

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Improving the Yield of Positive Breast Biopsies: A Statistical Analysis of Mammographic Patterns In a Private Practice

Joan L. Lasser, MD
Suzanne Lasser, MD

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Introduction

The increasing use of mammography for screening and diagnosis has led to more breast biopsies for women with palpable and occult breast lesions. A major criticism of the use of screening mammography as a public health policy is the high cost of identifying each cancer. The mammogram accounts for only one-third of the total cost of diagnosing breast cancer. Fifty to 90% of biopsies performed in the US reveal benign breast disease. Surgical consults and biopsies represent the largest category of induced costs of screening.¹ Besides the cost, biopsies are invasive procedures that can be psychologically traumatic. Biopsies can be disfiguring, time-consuming, costly, and may cause infection. Reviewing the sensitivity, specificity and positive predictive value of radiological findings and tracking why patients never undergo breast biopsies are two ways to improve the yield of positive biopsies in private practices as well as academic facilities.

Improved techniques of mammography have allowed radiologists to detect early cancers and subtle abnormalities. Consequently, recommending a biopsy or follow-up mammogram is increasingly more complex. The indications for a biopsy for a mammogram with a low suspicious lesion are still controversial.²

To avoid unnecessary breast biopsies and better understand breast cancer, we performed a cross-sectional study in a private practice office. We retrospectively reviewed symptoms and radiological findings of 175 women who had biopsies for suspicious lesions as identified by two radiologists. We calculated the sensitivity, spec-

ificity, positive and negative predictive value of radiologic findings in women with biopsy-proven benign and malignant breast disease. We compared radiologic findings such as mass size, mass shape, presence or absence of calcifications. Patients with and without clinically palpable lesions are considered separately in this analysis.

Methods

We analyzed data from 175 women at Kent Radiology, Inc. who had "suspicious" lesions on mammograms and who underwent biopsies during January 1988—June 1992. Excluded from the study are 46 wom-

Table 1.—Reasons Why No Biopsy Was Performed (n=46)

surgeon's 2nd opinion	19	41.3%
radiologist's 2nd opinion	13	28.3%
patient refused	9	19.6%
medical reason (eg, cardiac)	3	6.5%
no specifics	2	4.3%

en with suspicious lesions who never underwent recommended biopsies because of personal or medical reasons or professional second opinions. Nineteen of the 46 women never had a biopsy because of a surgeon's second opinion and 13 canceled biopsy plans because of a radiologist's second opinion (see Table 1). We omitted abnormal screening cases that were "probably benign" and for which the radiologist recommended periodic surveillance with mammography at 6-month to 1-year intervals to demonstrate radiologic stability. Additionally, we excluded screening cases diagnosed as simple benign cysts by ultrasonographic examination. Of 221 cases with suspicious lesions for which the radiologist specifically recommended biopsy, 79% had biopsies and were included in the study.

Kent Radiology, Inc. is a community, non-academic private practice with a primarily white clientele. The facility was ACR accredited during the study. The chief radiologist is board certified in diagnostic radiology and received formal mammographic training during her residency at Yale-New Haven Hospital, New Haven, Conn. She

reads about 33 mammograms per week and her assistant radiologist reads 8 mammograms per week. Patients were referred from primary care doctors in the immediate area. Community surgeons performed open or wire localized, excisional breast biopsies on the majority of patients; fine needle aspiration biopsies were performed in a small number of patients. No patient had a computer-guided, stereotactic breast biopsy for a nonpalpable lesion.

Patients and technologists filled out surveys before mammograms and reported clinical physical findings such as palpable lumps. The purpose of the survey was concealed. In this study, physical findings such as palpable masses were confirmed by the radiologist or trained technologist's physical examination. Mammograms of the 175 women included craniocaudad, mediolateral oblique, spot compression and magnification views. The selection criteria for recommending a biopsy included all mammograms that were graded "suspicious for malignancy, surgical consultation recommended" or "definitely malignant" by two radiologists. Suspicious masses included: 1) all poorly margined masses with terms such as "irregular," "stellate," "spiculated," and "indefinite borders;" 2) smoothly outlined solid lesions greater than 1 cm in diameter, confirmed by ultrasound; and 3) complex cysts, confirmed by ultrasound. The radiologists distinguished areas of suspicious microcalcifications as those varying in number, size, density and form (granular or casting). Casting calcifications were considered suspicious for intraductal carcinoma when the calcifications formed linear casts of the duct lumen or were branching. Clustering of small granular calcifications within the lobe of the breast was also considered suspicious.³

In our statistical analysis, we compared mammogram report descriptions of mass contour and the presence of malignant look-

ABBREVIATION USED

ACR: American College of Radiology
NPV: Negative predictive value
PPV: Positive predictive value

Joan L. Lasser, MD, is the head radiologist of Kent Radiology, Inc., of Warwick, RI. She received her radiology training at Yale University and Yale-New Haven Hospital. Suzanne Lasser, MD, graduated from Brown University School of Medicine, Providence, RI, in June 1993 and is currently an intern at Yale University and Yale-New Haven Hospital.

Table 2.—Mean Age

Patients with or without palpable lesions

Total 175 Patients	62.2 ± 14.1 years
Patients with malignant disease	67.1 ± 12.4 years
Patients with benign disease	58.6 ± 14.3 years

$P=.0004$ in the unpaired t-Test comparing the mean age of patients with benign or malignant disease.

Patients without palpable lesions

Total 118 patients	
Patients with malignant disease	66.7 ± 11.2 years
Patients with benign disease	62.3 ± 12.9 years

$P=.0696$ in the unpaired t-Test comparing the mean age of patients with benign or malignant disease.

Patients with palpable lesions

Total 57 patients	
Patients with malignant disease	67.5 ± 13.7 years
Patients with benign disease	46.1 ± 11.7 years

$P=.0004$ in the unpaired t-Test comparing the mean age of patients with benign or malignant disease.

Table 3.—Distribution of Benign and Malignant Cases According to Screening Age

Patients with or without palpable lesions

Patient Age >50 years	89.3 % of malignant cases
Patient Age <50 years	10.7 % of malignant cases

$P=.0014$ in chi-squared test comparing age of patients with benign disease versus patients with malignant disease

Patients with nonpalpable lesions

Patient Age >50 years	92.7 % of malignant cases
Patient Age <50 years	7.3 % of malignant cases

$P=.0582$ in chi-squared test comparing age of patients with benign disease versus patients with malignant disease

Patients with palpable lesions

Patient Age >50 years	85.3 % of malignant cases
Patient Age <50 years	14.7 % of malignant cases

$P=.0004$ in chi-squared test comparing age of patients with benign disease versus patients with malignant disease.

ing calcifications. We placed descriptions of masses as well defined, oval, round, lobulated into the category "regular" and descriptions of masses as indistinct, irregular, poorly defined, spiculated or stellate as "irregular."

Patients underwent biopsies read by the local community hospital, the University Hospital, and other local pathologists. We categorized results into benign and malignant groups to calculate sensitivities, specificities, and positive predictive values. "Benign" biopsies included high-risk lesions such as lobular carcinoma in-situ and atypical hyperplasia.

Results

The mean age of all patients studied was 62.2 years, and 89.3% of the cancer patients were over age 50. Of breast cancer patients with nonpalpable lesions, 92.7% were over age 50 as were 85.3% of breast cancer

patients with palpable lesions (Tables 2 and 3.)

The biopsy yield of malignancy in our population was 42.8%. In patients with nonpalpable lesions the biopsy yield of malignancy was 34.7% and for patients with palpable lumps the yield increased to 59.6% (Table 4.)

The histologic diagnoses from all breast biopsies are summarized in Table 5. Among the 75 cancers, 47 were invasive ductal carcinoma, 4 were invasive intralobular carcinoma, and 3 were ductal carcinoma in-situ. Note that 18.7% biopsies do not have a specific histologic diagnoses.

The sensitivity, specificity, positive predictive value and negative predictive value for various mammogram findings are summarized on Table 6. We found that one of the most sensitive, statistically significant radiologic findings of all patients with breast cancer was whether the patient had a mass rather than no mass on a mammogram (sen-

Table 4.

Biopsy Yield of Malignancy (Positive Predictive Value of Breast Biopsies)

Patients (Combined)	75/175 Malignant= 42.8%
Patients with nonpalpable lesions	41/118 Malignant= 34.7%
Patients with palpable lesions	34/57 Malignant= 59.6%

$P=.0018$ comparing patients with nonpalpable lesions vs. patients with palpable lesions.

Nature of Cancers Detected By Mammography

% Impalpable	41/75= 54.7%
--------------	--------------

Table 5.

Malignant Pathology n=75

Invasive Ductal Carcinoma	47	62.7%
Non-Specific Malignancy	14	18.7%
Invasive Intralobular Carcinoma	4	5.3%
Ductal Carcinoma In-Situ	3	4.0%
Lymphoma	3	4.0%
Colloid/ Mucinous Carcinoma	2	2.7%
Medullary Carcinoma	1	1.3%
Metastatic Carcinoma	1	1.3%

Benign Pathology n=100

Fibrocystic Disease	34	34.0%
Fibroadenoma	22	22.0%
No specifics given	13	13.0%
Atypical Hyperplasia	6	6.0%
Inflammatory Changes	5	5.0%
Cyst	5	5.0%
Intralobular Carcinoma In-Situ	4	4.0%
Duct Papilloma	3	3.0%
Fibrosis	2	2.0%
Scar	1	1.0%
Cystosarcoma Phylloides	1	1.0%
Lipoma	1	1.0%
Hidradenoma	1	1.0%
Atrophic Breast	1	1.0%
Hamartoma	1	1.0%

sitivity=81%, $P=.0011$). A mammogram finding of an irregular rather than a smoothly shaped mass had a striking sensitivity of 92% and a P value of .0004 by chi square, 2 by 2 table analysis. The sensitivity and P values for mass versus no mass and irregularly versus smoothly shaped mass categories were similar when we looked exclusively at patients with nonpalpable lesions (sensitivity=78%, $P=.0056$).

Statistically significant positive predictive values included finding of a mass rather than no mass and specifically an irregularly shaped mass rather than a smoothly shaped mass. Having a mass had a positive predictive value of malignancy of 51% during the analysis of all 175 patients and dropped to 44% when we analyzed only patients with nonpalpable lesions. The positive predictive value rose to 64% when one compared an irregularly shaped mass to a smoothly shaped mass in the analysis of all patients, 54% in patients with nonpalpable lesions,

and 79% in patients with palpable lesions.

In patients with palpable lesions and a suspicious mass, having calcification within a mass was highly predictive of malignancy (PPV=91%, $P=.0228$). The feature of having calcifications within a suspicious mass was not statistically significant in the other patient groups.

We found no statistically significant, very specific mammogram finding for patients with nonpalpable lesions or patients grouped as a whole. However, for patients with palpable lesions finding no suspicious calcifications had a specificity of 70% ($P=.0352$). Finding no calcifications within an existing mass had a specificity of 94% ($P=.0228$).

The negative predictive value was highest and statistically significant in patients with no mass versus a mass or a smoothly shaped mass rather than an irregularly shaped mass. In all patients, the negative predictive value was 84% if the mass was irregularly shaped rather than smoothly shaped.

We found no statistical significance in comparing masses > 2 cm or < 2 cm, or calcifications versus no calcifications as predictors of malignancy. Calcifications specifically within a mass were statistically insignificant in patients with nonpalpable lesions and patients analyzed with or without palpable lesions.

Discussion

Knowledge of the clinical significance of various mammographic patterns is an essential element in improving the positive predictive value of biopsies and the associated cost, psychological trauma, and risks associated with screening procedures. Our private practice audit correlated suspicious radiologic lesions with pathological findings and found that mass presence and mass contour analysis are the most statistically significant, sensitive findings on our mammogram reports. Finding calcifications rather than no calcifications on a mammogram was a statistically significant finding exclusively in our patients with palpable lesions.

Our mass contour analysis of suspicious lesions correlates with findings in previous studies in academic centers. Monostori et al found the descriptors "spiculated mass borders" and "irregular mass shapes" as highly significant predictors of malignancy in 231 cases of breast cancer ($P<.0001$).⁴ Goedde et al described that a "mass, alone or in combination with another abnormality, represents the most common abnormality" and that "the most ominous combination was a "mass with microcalcifications and spiculations." Goedde found a 44% malignancy yield of biopsy in 34 mammograms with "a

Table 6.—Sensitivity, Specificity, Positive Predictive Value and Negative Predictive Value of Mammographic Findings

Patients with or without palpable lesions							
Appearance	M	B	Sens	Spec	PPV	NPV	P
Mass	61	58	81%	42%	51%	75%	.0011
No Mass	4	42					
Irregularly shaped mass	56	32	92%	45%	64%	84%	.0004
Smoothly shaped mass	5	26					
Mass > 2 cm	21	20	34%	66%	51%	49%	.9948
Mass < 2 cm	40	38					
Calcifications	48	64	64%	36%	43%	57%	1.0
No calcifications	27	36					
Calcification within mass	24	17	39%	71%	58%	53%	.224
No calcification within mass	37	42					
Patients without palpable lesions							
Appearance	M	B	Sens	Spec	PPV	NPV	P
Mass	32	40	78%	48%	44%	80%	.0056
No Mass	9	37					
Irregularly shaped mass	29	25	91%	38%	54%	83%	.0062
Smoothly shaped mass	3	15					
Mass > 2 cm	7	10	22%	75%	41%	54%	.7564
Mass < 2 cm	25	30					
Calcifications	28	57	68%	26%	33%	61%	.5088
No calcifications	13	20					
Calcification within mass	14	16	44%	61%	47%	58%	.6839
No calcification within mass	18	25					
Patients with palpable lesions							
Appearance	M	B	Sens	Spec	PPV	NPV	P
Mass	29	18	85%	22%	62%	50%	.4934
No Mass	5	5					
Irregularly shaped mass	27	7	93%	61%	79%	85%	.0004
Smoothly shaped mass	2	11					
Mass > 2 cm	14	10	48%	44%	58%	35%	.6274
Mass < 2 cm	15	8					
Calcifications	20	7	59%	70%	74%	53%	.0352
No calcifications	14	16					
Calcification within mass	10	1	34%	94%	91%	47%	.0228
No calcification within mass	19	17					

* M= Malignant, B= Benign

mass with spiculation."⁵

In contrast to our analyses of masses and mass contour, our findings on calcifications

in mammograms are different from other published reports.^{4,5} We found that the presence of calcifications was a statistically

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insignificant predictor of malignancy in patients with impalpable lesions or patients with or without palpable lesions. However, calcifications specifically within a mass were statistically significant in patients with palpable lesions.

We found that mass size greater than 2 cm was a poor guide for predicting cancer. In 1988, Sener et al reviewed the mammograms and biopsies of 321 patients and found no significant difference in the rate of cancer when mass size was compared.⁷

Our biopsy yield of malignancy is comparable to a previous published article in our same community. At the local community hospital, the overall positive yield of biopsy in 200 patients with nonpalpable lesions was 37%. In our analysis, the malignancy yield was 34.7% for 118 patients with nonpalpable lesions.⁸

Although we have a similar malignancy yield as Baute et al, our yield is higher than we would like. Experts recommend yields between 10% and 30% to minimize occult malignancies that may be overlooked and maximize cost effectiveness and reliability.^{3,5} We believe our higher yield of malignancy may reflect discrepancies in the surgeon's willingness to operate as well as problems of radiologic interpretation. During the years of this retrospective review, surgeons performed primarily open breast biopsies; fine needle aspiration, stereotactic localization and core biopsies were not available at our community hospital. Of the 46 patients who never underwent a biopsy, 41.3% did not follow the radiologists' recommendations because of a "surgeon's second opinion." We believe that the lack of advanced biopsy techniques and our surgeons' unwillingness to operate significantly influenced who received biopsies in our population, our yield of positive biopsies, and our statistical analysis of masses and calcifications.

Although we believe that a thorough knowledge of the statistics and limitations of mammographic patterns is important, we must interpret our results in conjunction with the relevant clinical setting. Most published articles and audits do not track why patients refuse biopsies. In our audits, we need to address why patients do not undergo biopsies in a more systematic manner. It is time we expand our investigations and link our positive predictive value of biopsies with the independent decisions made by surgeons, patients, and other medical professionals. An audit should include calculation of the positive predictive value of breast biopsies, radiologic pattern analysis and tracking of patients who never obtained a recommended biopsy. Without such tracking we will never fully understand whether

our findings reflect discrepancies in the surgeon's willingness to operate, the availability of advanced biopsy techniques in a community, or problems of radiographic interpretation.

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Minor Blood Loss as a Cause for Normal Tension “Glaucomatous” Optic Neuropathy

Peter F. DeBlasio, Jr., MD
Peter C. Brasch, MD

In our practice we have observed that most of our patients with significant optic disc cupping and normal intraocular pressure (IOP) have a history of recurrent blood loss. Most of these patients were either blood donors or had heavy menstrual periods. They had consistently normal IOP and failed to demonstrate any other cause for progressive optic cupping other than frequent blood loss.

The findings of progressive optic cupping, field loss and IOP in the normal range has been termed “low tension” glaucoma.¹ Several investigators have attempted to identify the presence of generalized vascular abnormalities in these patients as compared to ocular hypertensives or normal individuals.¹⁻⁵ History of repeated blood loss may be a major factor in the production of normal pressure optic cupping since our series of patients has no other common risk factors for the development of this condition.

Materials and Methods

Our practice included a total of 33 patients with normal tension glaucoma; all were included in our study group. Thirty age-matched normal individuals were selected at random as a control group. All patients in both groups were asked about any history of blood loss, blood donation or heavy menstrual periods. Patients were examined and their records were reviewed. In all cases, complete ophthalmologic examinations were performed including visual acuity, refraction, slit-lamp examination, gonioscopy, applanation tonometry, diurnal intraocular pressure curves, dilated fundus examination, and visual field examination by static threshold perimetry and by tangent screen. To establish the diagnosis

fully, diurnal pressure readings were obtained on all patients in the morning, early afternoon and late afternoon during office hours. Some patients had as many as 100 separate intraocular pressure measurements at different times of the day. Patients having a history of uveitis, trauma to one or both eyes, narrow angle or angle closure glaucoma, intraocular pressure measurements above 21 mmHg at any time or other possible causes for optic cupping were excluded from the study group.

Results

Of the 33 patients in our study, 13 were male and 20 female. Ages ranged from 24 to 80 years with an average age of 53 years. The time followed ranged from 1.5 years to 11.3 years with an average time followed of 5.6 years. Intraocular pressure readings for all eyes of all patients ranged from 10 mmHg to 21 mmHg. Average intraocular pressure for all right eyes was 16.9 mmHg and left eyes was 16.9 mmHg. Average optic cup size was 0.73 for all right eyes and 0.71 for all left eyes. Optic cup asymmetry was present in 29 of 33 patients (87.8%). Of these 29 patients with cup asymmetry, 15 had the right cup larger and 14 had the left cup larger. All patients had glaucomatous visual field loss. All patients had diurnal intraocular pressure readings in the normal to low pressure range (ie, below 21 mmHg), before and after being started on therapy.

Thirty of 33 patients in the study group gave a history of minor blood loss (91%). Eighteen of 33 patients (55%) gave a history of repeated blood donation. Seven of 33 (21%) had a history of heavy menstrual periods; two of these required elective hysterectomy to resolve the chronic blood loss. They did not report any hypotensive event or hemodynamic crisis of any kind. Five patients (15%) demonstrated other types of blood loss: two patients had suffered a miscarriage, both requiring blood transfusions but no history of a hypotensive crisis; one patient had severe recurrent nose bleeds as a child; one had reported significant rectal bleeding for several months until the problem was treated; another had suffered a hemodynamic crisis from a ruptured ectop-

We postulate that . . . “minor” type of blood loss causes subclinical ischemic insults to the optic disc, which results in progressive disc cupping despite normal intraocular pressure.

ic pregnancy requiring blood transfusions. Three of the 33 patients (9%) gave no history of any type of blood loss.

There were 30 age-matched normal patients in the control group. All control patients were randomly selected and had completely normal ophthalmic exams. There was no evidence of low tension glaucoma in any of these patients. Eight of 30 patients (26.6%) in this group gave a positive history of blood donation. Of these eight patients, six (75%) were one-time donors only and two (25%) were repeat donors.

Discussion

Previously, Drance et al² considered transient shock-like states to be a possible etiologic factor in so-called “low tension” glaucoma. In their series, 13 of 45 patients with “low tension” glaucoma suffered either a major blood loss (ie, GI or uterine hemorrhage), hypotension during anesthesia or cardiac arrest. Besides these severe hemodynamic crises, they also reported 4 patients with “low tension” glaucoma who had suffered minor hemodynamic upsets such as postural hypotension, congestive heart failure or intermittent cardiac arrhythmia. In another publication,⁴ these authors suggested that the optic neuropathy associated with a single shock event did not progress, implying that repeated episodes of hemodynamic crisis may produce a progressive optic neuropathy.

In our practice, we have observed that less critical amounts of blood loss may also be producing disc cupping and field loss. To our knowledge, this has not been previously addressed in the literature and could be a more widespread and insidious contributor to the development of normal-pressure optic cupping (“low tension” glaucoma). Moreover, periodic donation of 500 cc of blood or other minor blood loss would be a more common and many times recurrent event as opposed to a major hemodynamic crisis. We postulate that this “minor” type of blood loss causes subclinical ischemic in-

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ABBREVIATIONS USED

GI: Gastrointestinal
IOP: Intraocular pressure

sults to the optic disc, which results in progressive disc cupping despite normal IOP.

In any type of blood loss, endogenous replacement of lost plasma volume is a gradual process and is accompanied by mobilizing albumin-containing fluid from extravascular sites, requiring a period of hours to days to complete, depending upon the magnitude of the blood loss.⁶ Immediately following a hemorrhage before red cell mass is replaced, oxygenation of tissues initially must be maintained by adjustments in cardiovascular dynamics. This is accomplished by arteriolar constriction in certain oxygen-insensitive areas and a decrease in vascular resistance in sensitive organs where oxygen delivery is essential.⁶ During this critical period of redirection of blood flow and replenishment of intravascular volume, the optic disc vasculature may be at risk for ischemic insult. It is generally accepted that the prelaminar optic disc receives its blood supply from two main sources: the capillaries of the short posterior ciliary arteries and the peripapillary choroid.⁷ Hayreh⁸ has suggested that the relationship between blood pressure in the centripetal disc vessels and the intraocular pressure determines the patency of these vessels and that a critical balance exists: it is thus conceivable that, at normal IOP, an acute loss of 500 cc of blood could cause poor perfusion to the prelaminar optic disc. We hypothesize that this ischemic insult enlarges the cup in susceptible individuals, and a clinical picture develops which is similar to chronic open angle glaucoma except that intraocular pressure *per se* has little influence on the pathogenesis of the disc cupping and field loss. The term "low tension" glaucoma indeed may be a misnomer in some cases, since tension may have little, if any, effect on the etiology of the condition. A more appropriate term that better describes the pathogenesis might be hemodynamic pseudoglaucoma.

In the US, the standards of American Association of Blood Banks permit blood donation every 60 days.⁹ In Great Britain, donations are permitted 3 times per year.¹⁰ Repeat donations are presumably safe and are encouraged by hospitals and community blood centers. The US national average blood collection rate in 1990 was 50 units per 1000 people or 5%, based on community blood center data and excluding hospital-based collections.¹¹ In Great Britain, 5% of the population eligible on the basis of age are blood donors.¹⁰

Our series of patients suggests an association between optic cupping with normal IOP and "minor" blood loss. Hemodynamic insults to the optic disc may be the basis for

progressive optic cupping in many of the patients previously considered to have "low tension" glaucoma. It may be prudent in the future for all patients with disc damage and normal IOP to have a careful history regarding blood loss.

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The Alcohol Withdrawal Syndrome

Roger G. Berard, MD

Managed care has profoundly affected the availability of treatment for substance abusers, resulting in the closure of a number of major treatment facilities. This will force many of these patients to seek help at local hospitals, and so it behooves every clinician to have a better understanding of the pathophysiology of the alcohol withdrawal reaction and its optimal treatment. It is important to properly assess the patient initially and select treatment that lowers morbidity and mortality.

Alcohol Withdrawal Pathophysiology

Alcohol withdrawal syndrome is a group of symptoms and physiological evidence of the sudden cessation of alcohol consumption in an individual who had been ingesting sufficient amounts of alcohol over an extended period of time.¹⁻² The withdrawal state is variable and determined largely by the amount of alcohol consumed as well as the duration of use.

Long-term maintenance of high concentrations of alcohol in the blood produces a state of physiological dependence. An abrupt decrease of intake produces the withdrawal syndrome. The severity of the withdrawal state is largely predictable when an appropriate history is obtained. One can simply determine the usual physical state of the individual on awakening. Does he have symptoms of withdrawal? Does he have insomnia or a disturbed sleep pattern? Does he have excessive sweating or tremors? Does he feel anxious and restless and feel the need for a drink? If he does, then one can anticipate a moderately severe withdrawal reaction. This patient will need close monitoring over the next several days and adequate replacement therapy to avoid potentially severe side effects such as seizures and delirium tremens. Unless adequate therapy is initiated early enough it is also important to be aware of the fact that some severe alcoholics will enter into a state of confusion lasting several days. Attempts to re-

verse this process with large doses of medication will not be effective. The delirium state can manifest itself with agitation, hyperthermia and eventual cardiovascular collapse. The reason for this irreversibility is unclear.

Recognition of Alcohol Withdrawal

The patient will rarely admit to his excessive drinking. The clinician therefore needs to learn how to obtain an accurate history of alcohol intake by inquiring into family, workplace or legal issues that usually are present. The clinician needs to maintain a high index of suspicion that the presenting complaints of anxiety, agitation and disturbed sleep pattern are not in fact evidence of alcohol withdrawal. Failure to recognize this may compound the problem when tranquilizers, such as benzodiazepines and sleep medication, which are also drugs of abuse, are prescribed. It is important to understand that the alcoholic has a compulsive need to continue to drink and so will protect his continued abuse of it.

Presentation of Withdrawal State

The withdrawal state may be very mild with agitation, restlessness and disturbed sleep pattern. However, the main symptoms that require close monitoring are those involving prolonged agitation, restlessness, tremors and cardiovascular changes. This also may include usually transient hallucinations. Withdrawal seizures are also commonly seen and will be discussed later. The more severe withdrawal reaction is that of delirium tremens, which remains very difficult to deal with and may lead to a fatal outcome, especially if there are accompanying medical problems. These more severe reactions are avoidable if prompt recognition of the problem is made and appropriate treatment is initiated early.

Assessment of Withdrawal Reaction

Many withdrawal assessment scales have been proposed.³ Initially they served as research tools to study the effectiveness of treatment but lately they are being used as guides to determine therapeutic needs. Table 1 presents an acceptable assessment

Most of the signs and symptoms of alcohol withdrawal can be explained primarily as a hypernoradrenergic state

scale that can be used in any clinical setting. Care should be taken that any accompanying cardiovascular problem be considered, such as hypertension, in evaluating the severity of the withdrawal reaction.

Treatment of Withdrawal Syndrome

The alcohol withdrawal syndrome can be mild and uncomplicated. It can be treated on an outpatient basis or in a social setting, as suggested by Whitfield, without significant morbidity. However, more recent studies suggest that all withdrawal reactions should be treated with pharmacotherapy since, in a process analogous to the kindling effect, each subsequent withdrawal will become worse unless there is appropriate replacement therapy. In this country the most popular form of treatment is the use of benzodiazepines (BDZ).⁴ They are particularly effective because of their cross-tolerance and cross-dependence and represent a good form of replacement therapy. Some physicians prefer long-acting BDZ while others prefer the shorter-acting benzodiazepines such as lorazepam and oxazepam. There are advantages to either groups.

Factors that need to be considered in selecting the most suitable drug include method of administration and degree of hepatic and/or renal failure. Some have suggested a large priming dose. Traditionally, they have been given in gradually tapering doses over several days as determined by the withdrawal scale. Table 2 presents an effective dosage schedule that is safe and avoids any possible overtreatment. This is especially true when it is applied to the degree of withdrawal as measured in Table 1.

Although BDZ remains the most standard form of therapy in the US, other medications in vogue in other countries have been compared to BDZ in random double-blind studies.

Carbamazepine⁵ (CBZ) is an iminostilbene derivative, resembling the tricyclic antidepressant imipramine. It is the primary drug therapy for trigeminal neuralgia and

ABBREVIATIONS USED

BDZ: Benzodiazepines
CBZ: Carbamazepine
PO: Per os (by mouth)

Roger G. Berard, MD, has served as medical director of the Substance Abuse Program at the Veterans Administration Medical Center, Providence, Rhode Island, 1990-1993, and is certified in addiction medicine.

Table 1.—Alcohol Withdrawal Assessment Scale

- 1) **Pulse**
 - a) 80-90/min. (1)
 - b) 90/min or more (2)
- 2) **Blood Pressure**
 - a) 150/90-180/90 (2)
 - b) 180/95 or higher (3)
- 3) **Nausea and/or Vomiting**
 - a) mild nausea with dry heaves (1)
 - b) constant nausea with frequent vomiting (2)
- 4) **Tremors**
 - a) Palpable to fingertips only (1)
 - b) Moderate and grossly visible (2)
 - c) Severe. even with arms at side (3)
- 5) **Anxiety and/or Agitation**
 - a) Mildly anxious with increased activity (1)
 - b) Moderately anxious with associated restlessness (2)
 - c) Severely agitated and anxious—near panic reaction (3)
- 6) **Confusion**
 - a) Mild—uncertain about date or whereabouts (1)
 - b) Moderate—disoriented as to time, place and surrounding events (2)
 - c) Severe—completely disoriented as to time, place and person (3)
- 7) **Perspiration**
 - a) Mild—barely perceptible and moist palms (1)
 - b) Severe-drenching sweats (2)

As a routine, the patient should be evaluated on admission and the blood alcohol level should be known. During the first 24hrs. the patient needs to be evaluated every 6hrs. and medicated appropriately if necessary. During the second 24 hrs. the patient needs to be evaluated every 8 hrs. and treated according to his scoring. On the days following the need for further evaluation should be individualized according to the severity of the withdrawal.

At each evaluation the individual doing the evaluation should initial the record.

The Scoring Evaluation is represented by the number in parenthesis after each finding.

temporal lobe epilepsy. It was tested initially because of its ability both to retard the development of kindling in the limbic system and suppress established kindled loci. It is also effective in reducing long-term neurologic, behavioral and psychiatric complications of alcoholism.⁶ Although it has not been proven superior to BDZ in managing the withdrawal state, there are substantial advantages in reducing the agitated state and evening out mood disturbances. It will probably prove to be most advantageous when applied in an outpatient setting since it is not a drug of abuse. It can also be used adjunctively in combination with BDZ to reduce mood disturbances during withdrawal. It may also prove to be effective in the long-term management of the alcoholic in the rehabilitation phase of recovery.

Most of the signs and symptoms of alcohol withdrawal can be explained primarily as a hypernoradrenergic state demonstrated by elevated central and peripheral norepinephrine (NE) and its major metabolite 3-methoxy-4-hydroxyphenylglycol (MHPG). Clonidine has been proposed as an alternative mechanism of action by specifically binding at the presynaptic A₂ adrenergic receptor sites. This results in an overall

Table 2.—Treatment Schedule (Librium, PO)

Assessment Scale Score*	Dosage
0	0
4 +	25 mg
6 +	50 mg
8 +	75 mg
10 +	100 mg

*See Table 1 for scoring.

decrease in noradrenergic overflow from the locus coeruleus nucleus.

Clonidine has been used in opiate withdrawal for some time and found to be quite effective.⁷ It has also been tested in a number of trials in alcohol withdrawal with significant amelioration of symptoms. However, it does not reduce significantly the subjective complaints, such as anxiety and agitation, prominent in some individuals. Clonidine, used parenterally, is most effective in noncompliant patients and also for outpatient use.⁸⁻⁹

There have been several reports of clonidine having abuse potential either when used alone or in combination with other drugs, possibly potentiating the euphoric

effects of the drug taken concomitantly.¹⁰

Propanolol has been used on occasion but generally is effective only when used with BDZ, especially to minimize persistent tremors.

Withdrawal Seizures

Certainly seizures pose a severe threat during withdrawal.¹¹ The best treatment is avoidance by early and adequate replacement therapy with BDZ. The patient with a history of previous withdrawal seizures may need to be monitored more closely or given additional medication for a longer time. Diphenylhydantoin (dilantin), which is effective in epilepsy, does not seem to significantly reduce the incidence of withdrawal seizures. Many papers have documented the relative ineffectiveness of dilantin in these cases. It is recommended only in those individuals with prior epilepsy or other pre-existing seizure activity maintenance. The drug should then be continued during the withdrawal phase.

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Peter Pineo Chase, MD: A Biography

Seebert J. Goldowsky, MD

... an authority on theory and therapy,
tomes and tonics, scalps and scalpels .
... a doctor who writes more than pre-
scriptions, for both the medic and the
millions . . .

The *Rhode Island Medical Journal* was established in 1917 as a merger of the *Providence Medical Journal* and the *Transactions of the Rhode Island Medical Society*. In the three-quarters of a century since its founding, it has had seven editors-in-chief: Roland Hammond (1917-1920), Frederick M. Brown (1921-1942), Peter Pineo Chase (1942-1956), John E. Donley (1957-1961), Seebert J. Goldowsky (1961-1988), and the incumbent, Stanley M. Aronson (1988-present).

In sifting through piles of papers in preparation for a change of residence, I came upon a lengthy obituary of Peter Pineo Chase, one of my predecessors as editor-in-chief of the Journal. This prompted me to put on the record some facts about Chase, probably the most colorful of the lot.

Doctor Chase was a master of many skills. He was born in Hyannis on Cape Cod on August 26, 1878 in the old Pineo homestead. He was of mixed Yankee and French Huguenot ancestry. Not much is said of the Chases, except that they were "Old Comers" to Cape Cod. The Pineos came to New England late in the 17th century along with other Huguenots. The Pineos were a restless lot and moved about a great deal. His ancestor, James Pineo, lived for a while in Bristol, Rhode Island, not too far from his Huguenot kin in Frenchtown, Kent County. From Bristol the family moved to Connecticut and thence up the Connecticut Valley into Vermont and Maine, and eventually to the village of Cornwallis in Nova Scotia in the vicinity of Grand Pré. Doctor Chase's maternal grandfather, a remarkable man in many ways, was a skilled surgeon, a bold thinker, who once, in a Fourth of July speech, advocated women's suffrage, and who, it is said, loved life and lived it to the hilt. He was short, wiry, and energetic like his grandson. He studied medicine at Bowdoin College in Maine and was admitted to the Massachusetts Medical Society, tantamount to licensure, in 1850. He might well have been known to Doctor Usher Parsons of Providence, a member of the Society and

about whom in later years Doctor Chase wrote a biographical sketch published in the *New England Journal of Medicine* (April 1956).

When the Civil War broke out, Pineo joined up and was sent to the front as brigade surgeon of the 9th and 10th Massachusetts Infantry. He was later appointed medical inspector of the Army of the Potomac. At the end of the war, in his role as medical inspector, he visited Jefferson Davis in prison at Fortress Monroe, and was instrumental in obtaining better medical care for him and alleviating the harsh and vindictive treatment to which he had been subjected.

After the war, Pineo traveled north and settled in Hyannis because it was near a large army hospital where he then worked. There he met, courted, and married one Elizabeth Crosby. They settled down in a huge old Cape Cod house of 16 rooms to which he added on randomly as his family grew. The house acquired an incongruous look for Cape Cod, but he is said to have liked it that way. Photos of Pineo in Civil War uniform were displayed proudly in Chase's home on Congdon Street in Providence. Pineo passed away in 1891.

Pineo's daughter Maude married one Herman B. Chase, a hay and grain dealer of Hyannis, to which union Peter Pineo Chase was born in the old Pineo homestead on August 26, 1878. He spent his boyhood on the Cape and attended Hyannis Grammar School and Barnstable High School, which in those days were in the same building. After graduation he worked for a while as a clerk for a wholesale grocer in Boston and later tried his hand at farming. In the fall of 1901 at the high school Thanksgiving football game, scouts from Brown University saw a wiry halfback jump over a tackler and scamper 50 yards for a touchdown. Chase said later that this was the only time he had done anything so spectacular. But he may well have inherited his athletic skill from his grandfather Pineo, who in advanced years could jump over a chair from standing start.

In any case, the next fall he entered Brown University, much to the satisfaction of his mother and grandmother Pineo. He was pledged to Alpha Delta Phi fraternity.

Chase played varsity football at Brown

for 4 years. He and his teammate, the legendary John Mayhew, were an exceptionally talented pair of halfbacks. He himself said that he didn't do much at college but play baseball and study. But, in fact, he also of course played football and for good measure captained the hockey team. After graduation he entered Harvard Medical School—a common path over the years that happens even today in the shadow of the Brown University School of Medicine. On one of his early summer vacations, he traveled to Europe on a cattle boat. During the trip in London he read Boswell's *Life of Johnson*, which led to a lifelong and scholarly passion for Samuel Johnson.

Following graduation from medical school in 1910, he interned for 2 years at the Rhode Island Hospital and then entered private practice in Providence. He was appointed physician to students at Brown University.

With the outbreak of World War I, he went to France as surgeon in the Harvard Unit with the British Army. When the United States entered the war in 1917, he, with the rank of captain, and his comrades transferred to the American Expeditionary Forces and served until 1919. He was assigned to forward hospitals in the offensives that pushed the Germans back to the Rhine. He spoke little of his wartime experience, except to describe combat surgery as demoralizing. There was, he said, little nicety, but much cut and slash.

After the war he returned to private practice in Providence and his appointment as assistant surgeon at Rhode Island Hospital. In 1922 he married Helen Emerson, a Bryn Mawr graduate, a skier and mountain climber. She introduced him to these pursuits, and for many years they climbed and skied all over the mountains of New England. They settled in one of Providence's historic East Side homes at 104 Congdon Street. Their home, terraced steeply in the rear to Benefit Street, provided a handy ski slope in their own back yard.

Doctor Chase practiced general surgery at 122 Waterman Street and advanced to the rank of Visiting Surgeon at Rhode Island Hospital. He retired from the active staff in 1938, continuing to serve the hospital as consulting surgeon. He also was on the staff

Seebert J. Goldowsky, MD, is consulting surgeon, *The Miriam and Rhode Island hospitals* and editor-in-chief emeritus, *RHODE ISLAND MEDICINE*.

of the Providence Lying-in Hospital. During World War II he returned to active staff work at Rhode Island Hospital to help in replacing the many physicians who had gone off to war. After the war he went to Germany with a group of physicians to offer refresher courses to European displaced persons physicians, a project sponsored by the International Refugee Organization, the Unitarian Service Committee, the American Joint Distribution Committee, the Society of Friends, and the Church World Service. His colleague, Doctor Alexander M. Burgess, like Chase a devoted Unitarian, had an active part in the arrangements.

In 1942 he was appointed editor-in-chief of the *Rhode Island Medical Journal*, in recognition of his literary interests. He served the Journal until his death in 1956.

For many years Doctor Dennett Richardson, superintendent of health in Providence, had written a medical column for *The Providence Journal* and *The Providence Evening Bulletin*. Upon his passing Doctor Chase was invited to take over the column, titled "You and Your Health" and carried on this chore until his death. His column, described as intimate and human, was eminently readable, in colloquial language, and cheerful. It was salted with his characteristic dry and pungent wit. He engagingly punctured many a fallacy and exploded popular myths.

His interest in Samuel Johnson was a hobby which, as we have noted, he acquired as a student traveler in England, and which he rode for 20 years. He corresponded sporadically with James Clifford and other Johnson scholars, and eventually was invited to membership in the exclusive [Dr. Samuel] Johnson Society, a group of some 60 university professors, experts, and devotees of the London sage.

He was also the author of a popular medical book, *Your Wonderful Body*, published posthumously by Prentice Hall in 1957. Although readable and witty, it never attained best-seller status.

He was a long-time member of and served as president of both the Providence Medical Association and the Rhode Island Medical Society, and was a member of the American Medical Association, a Fellow of the American College of Surgeons, and a member of the University Club (Providence), and the Providence Art Club.

Robert L. Wheeler, in his obituary of Doctor Chase, wrote:

... in the room the doctor used as a study ... stands a bookcase containing [grandfather] Dr Peter Pineo's library—and calf-bound sets of Dickens and Shakespeare.

Don Quixote in a faded green binding [and] the Waverly Novels in crabbed type ...

... if you pass through ... [the] house and descend the cellar stairs and take a turn to the right, you leave the 19th and 20th centuries behind and enter a room of mellow shadows, where the sunlight drifts through an embrasured window, and a great fireplace yawns.

Flanking it is a high-backed settle, and the other three walls are lined with bookcases. Tooled bindings catch the sunlight. Many of the books are very old. All of them relate to the literary world of the 18th century in England—the world of Johnson and Goldsmith and "Bozzy" [Boswell] and Garrick and all the other wits and philosophers and poets who clustered about Dr Samuel Johnson ... Chase's hero ever since he read the "Life" [of Johnson] in London town as a young man in a hotel room, and yet not lonely, for Boswell's book gave him company enough, along with the best minds of a great age ...

Chase, as active as ever to the end, passed away unexpectedly at his Congdon Street home on April 23, 1956 in his 78th year. He was survived by his wife; there were no children. His funeral and memorial service were held at the first Unitarian Church in Providence. The service, attended by an overflow audience of 700 professional and business persons and dignitaries, was conducted by the late Dr Robert H. Schacht, minister of the church. Among those attending were Doctor Barnaby Keeney and Harold B. Tanner, president and chancellor respectively of Brown University, and Sevellon Brown 3rd, and G. Pierce Metcalf, editor and president respectively of *The Providence Journal*, as well as representatives of the medical community and the Providence Art Club, of which he was a popular member.

Doctor Schacht read two citations recently presented to Doctor Chase, one by the Providence Art Club and the other by the University Club:

You are an authority on theory and therapy, tomes and tonics, scalpels and scalpels, and even animal chlorophyll—yet you are a doctor who writes more than prescriptions, both for the medic and the million, whether you are introducing Hillary to an audience or hilarity to our midst, whether you are president of a Medical Society, a Fellow of Surgeons, a Friend of a Library, an associate of history, a luncheon companion—you are articulate and sometimes even listen.

Few know so well so many of their fellow men inside and out. With the cutting edge of his wit equal to that of his scalpel he excises false pride and proud flesh with like success.

Missing from these encomiums was mention of the fact that when Doctor Chase pronounced the letters L and R, they sounded like a W! His devoted wife Helen was always "Hewwen."

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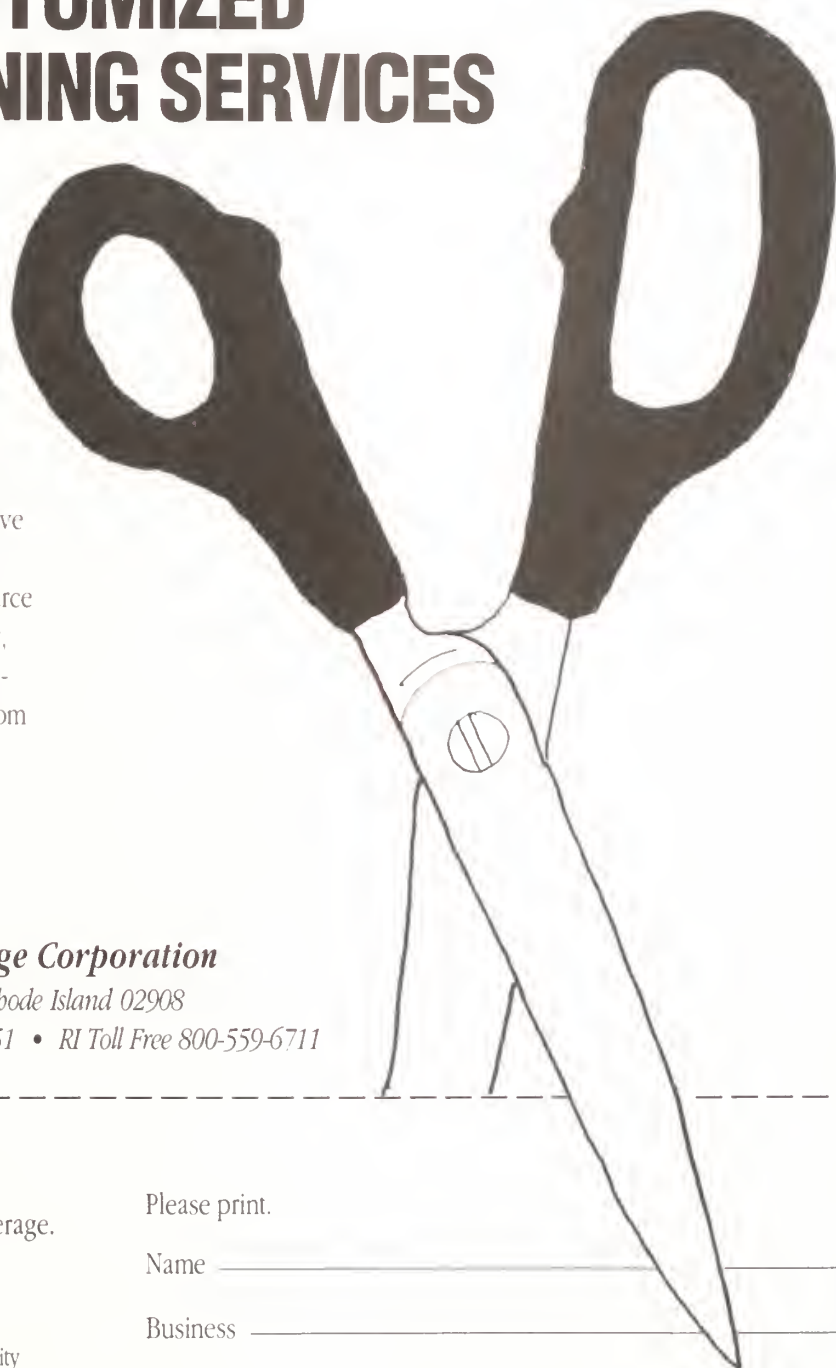
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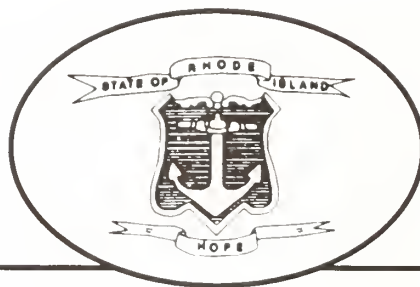
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HEALTH BY NUMBERS



Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Cesarean Section Rates in Rhode Island, 1986-1992

The national target set by Healthy People 2000 for cesarean section deliveries (Objective 14.8) is to reduce cesarean deliveries to 15 per 100 deliveries (15%) by the year 2000. In Rhode Island, the proportion of deliveries by c-section has been decreasing (Figure 1). In 1986, 23.8% of all deliveries were by c-section (3166 c-sections among 13,284 deliveries). By 1990, this proportion decreased to 19.9%. However, between 1990 and 1992, the c-section rate in Rhode Island remained constant at 19.9% (3039 c-sections among 15,274 total deliveries in 1992).

Nevertheless, the primary and repeat c-section rates, which comprise the total c-section rate, have continued to change over the past 7 years (Figure 2). The Healthy People 2000 target for primary cesarean deliveries is 12 per 100 deliveries (12%). Between 1986 and 1990, the primary c-section rate in Rhode Island decreased steadily from 14.4% to 11.7%. However, this downward trend appears to have stopped, with the primary c-section rate increasing to 13.1% in 1992.

In contrast to the primary c-section rate trends, the repeat c-section rates have been consistently going down over the past 7 years. In 1986, the repeat c-section rate was 9.4%; by 1992, this rate had decreased to 7.3%. The principal reason for this decrease in repeat c-section rates is the increase in vaginal births after a previous c-section (VBAC).

Noting that repeat c-sections accounted for approximately 48% of the increase in the cesarean delivery rate between 1980 and 1985, the American College of Obstetricians and Gynecologists (ACOG) issued guidelines in October 1988 regarding vaginal birth after a previous cesarean delivery. Those guidelines recommended that without a contraindication, women with one previous c-section with low transverse incisions should be counseled and encouraged to attempt labor in their current pregnancy.

In 1986, there were 207 VBACs (1.5%

of total deliveries) in Rhode Island. By 1990, the number of VBACs in Rhode Island had risen to 555 (3.5% of the total deliveries), a 168% increase from the 1986 figure.

The rate of c-sections among individual hospitals in Rhode Island varied between a low of 19.0% and a high of 24.8% during 1992 (Figure 3). This 5.8% range among the hospitals has decreased from a 9.5% range in 1990. This is largely due to the decrease in the maximum rate seen each year.

Rhode Island c-section rates have been lower than those for the nation in recent years, by more than 3 percentage points (Figure 4). In 1990 and 1991, the c-section rate for the United States was 23.5%, whereas, the rates for Rhode Island for both those years, was 19.9%. Similarly, rates of primary c-section deliveries for Rhode Island have been lower than the nation, 12.6 vs 17.1 respectively in 1991.

Thus, to meet or exceed the national objective for overall c-section rates, Rhode Island must reverse the recent trend in primary c-section rates, and continue the trend toward lower repeat section rates and more VBACs. The Department of Health will work with health care providers, third-party payers, and with the soon to be established RIte Care Managed Care Plans toward these objectives.

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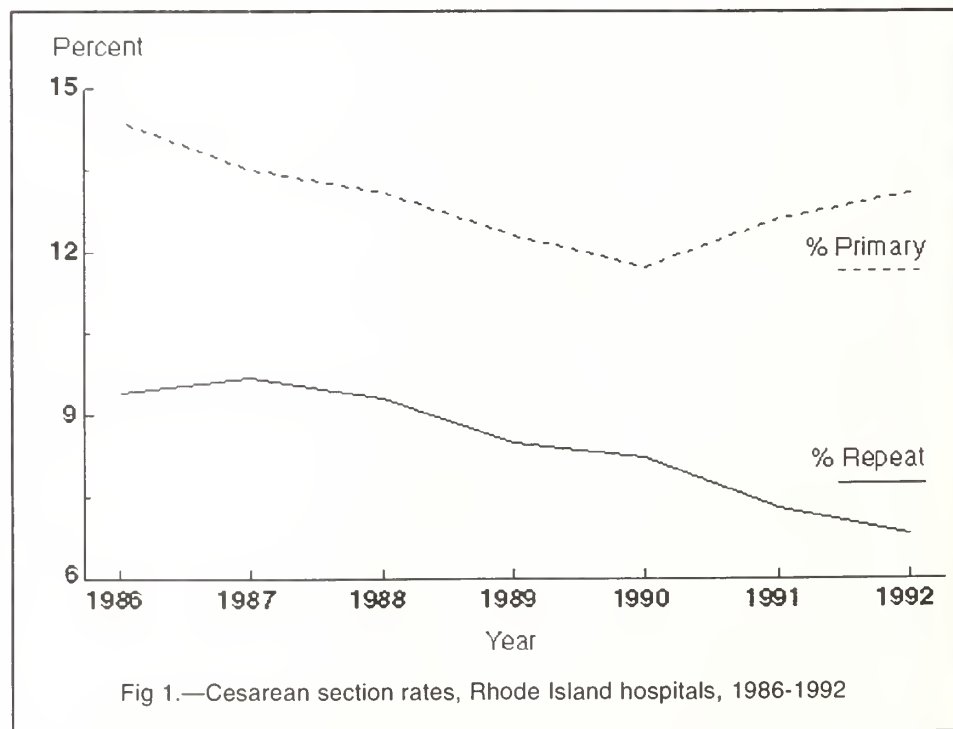


Fig 1.—Cesarean section rates, Rhode Island hospitals, 1986-1992

Fig 2.—Primary and repeat cesarean section rates, Rhode Island hospitals, 1986-1992

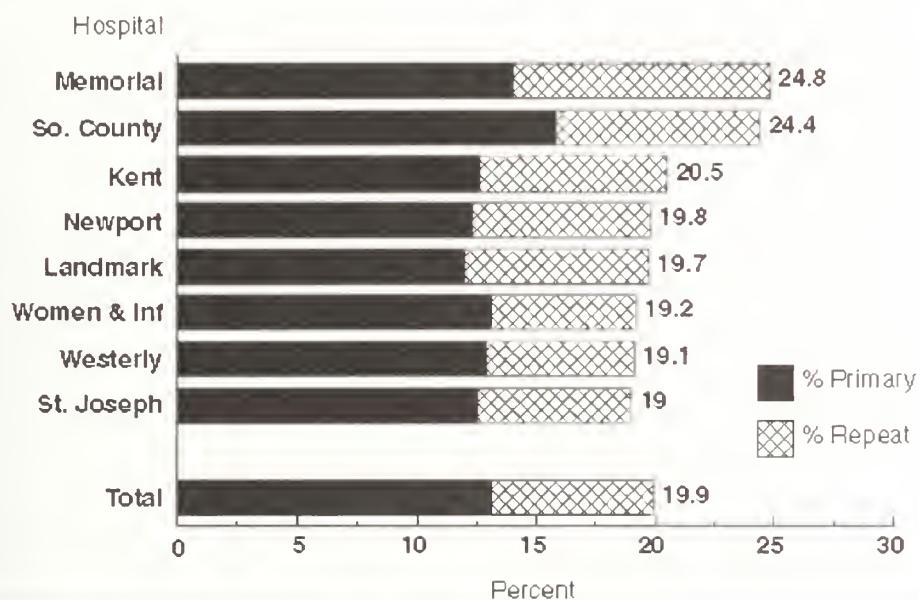
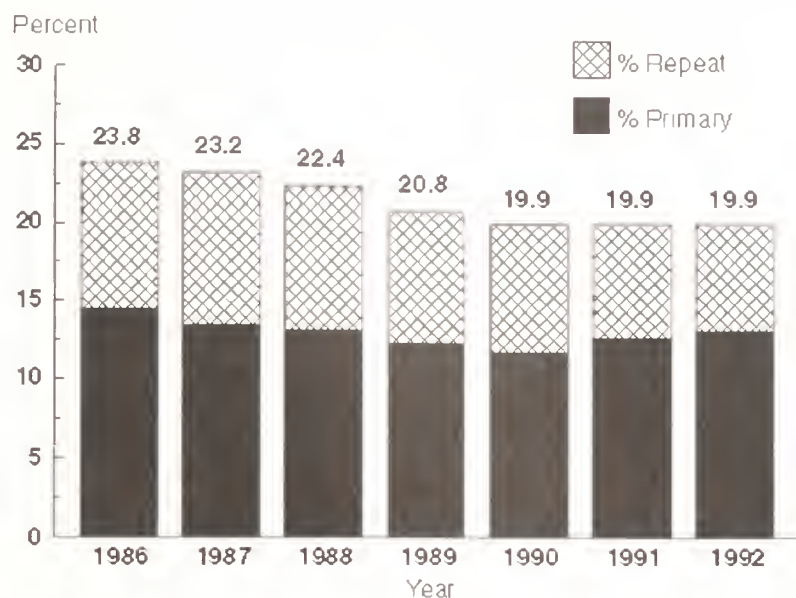
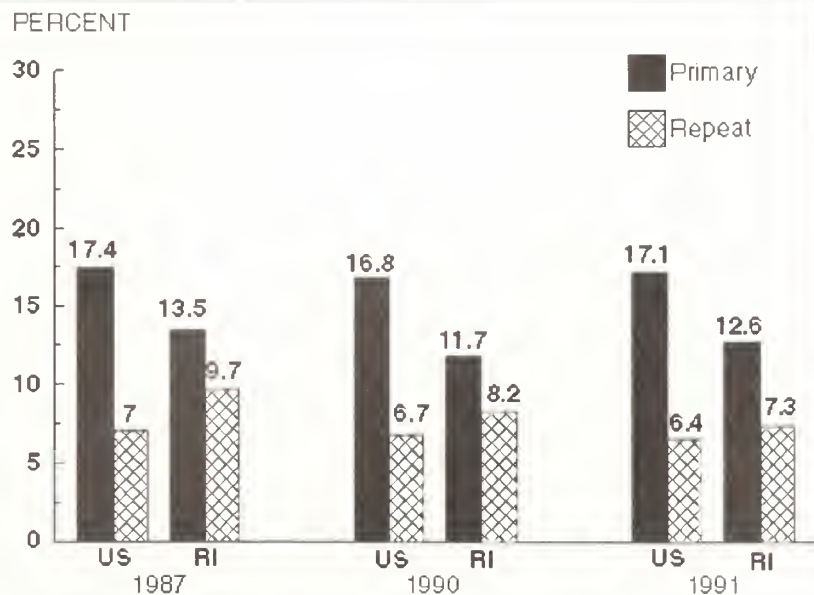


Fig 3.—Cesarean section rates by hospital, Rhode Island hospitals, 1992

Fig 4.—Cesarean section rates, hospitals in Rhode Island and the United States, 1987, 1990, and 1991



THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (February 1904)

Donald Churchill, MD reports on a case of purpura hemorrhagica. The patient was a 28-year-old married woman who experienced the sudden onset of severe pain in both legs. Examination showed some tibial tenderness and faint purpuric spots over both legs. By the next morning, there were extensive ecchymoses of the face, and on the following day the purpura was generalized and accompanied by an episode of hemoptysis. The purpura finally disappeared. Therapy consisted of abundant intake of citrus fruits. Scurvy was initially considered but discarded because of the atypical history and the absence of any dietary inadequacy. The diagnosis of purpura hemorrhagica was finally proposed. This case is in keeping with Osler's observation that the disease "... is often met with in young women, especially delicate individuals."

G. Edward Buxton, MD, offers a paper entitled, *The Doctor in Court*. After a series of personal experiences, many painful, and some anecdotal evidence from colleagues, the author concludes: "First, how trifling may be the cause that takes the doctor to court. Second, the court is often used as a kind of bunco game, to extort money from those doctors who have any, by schemes, often no better than blackmail. Third, when once in court, the doctor's danger lurks with the jury; because in a general way they bear him prejudice; because they are not competent to decide on the merit of his work, often expecting the impossible and holding the doctor responsible; because there may be and often is a juryman with a fancied grievance, believing some doctor failed in his duty when he lost some loved one. And again, because a jury being an unstable, fleeting, evanescent body, here today and gone tomorrow, does not have that abiding responsibility and cannot feel the weight of continued obligation that would follow the

decisions of a more tangible authority."

The minutes of the quarterly meeting of the Rhode Island Medical Society, conducted in the YMCA Hall, are published. The membership voted to extend its fullest cooperation to the census department and its newer methods establishing a "uniform and intelligible tabulation of cause of deaths." A letter from Dr W. W. Keen asked for funds for a memorial to honor the late Dr Walter Reed. A plan to reorganize the governance of the Society was addressed. The remainder of the meeting was devoted to the reading of scientific papers.

An editorial, written by Charles V. Chapin, MD, superintendent of health, discussed the health of Providence. The report noted only one case of smallpox during the prior 2 months and only 47 cases of typhoid fever. There has been a substantial rise, though, in the incidence of diphtheria (124 cases) and scarlet fever (81 cases.)

50 Years Ago (February 1944)

The lead article discusses medical problems in the tropics and represents a paper collectively written by Rhode Island physicians (principally Drs Cutts, Lawson, Beck and Dillon) stationed in military camps in India. There are brief discussions on

Kala-Azar, abdominal surgery, tropical ulcer, malaria, amebic abscess of the liver, relapsing fever, catarrhal jaundice and the treatment of burns.

Henry Sage Dunning, MD, DDS, writes on the practice of oral surgery by the general practitioner. The author describes the aims and procedures of dental surgery, stressing that all dentists should be qualified to perform surgical procedures. Some typical dental problems and their solutions are summarized.

Postwar planning and social action are described by Herman Finer, PhD, a special consultant from Great Britain on post-war reconstruction. The basic premise put forth by the author is: "It is certain that when the world returns to normality it will not be the normality of the old kind but a new normality." In conclusion, he notes: "... full employment in America is to be had only if America is a full and free unit in the great economy of the whole wide world. Therefore, any measures required in the postwar development abroad of industry and agriculture on a cooperative basis with America is part and parcel of the American economic Social Security program."

Irving Beck, MD, (Captain, MC) discusses the laboratory diagnosis of malaria in the China Burma India theater of military operations. Laboratory methods are care-

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fully outlined, including the technical procedures in the microscopic examination of thick and thin preparations.

The lead editorial considers the threat of malaria in Rhode Island and the need, therefore, for more stringent anopheline mosquito control locally. As recently as 1920 malaria was endemic to Rhode Island. The editorial concludes: "A statewide survey is imperative at this time to discover any breeding places of the anopheline mosquito."

An editorial discussing the intricacies of compulsory hospital insurance expresses considerable reservations about this government-sponsored enterprise. "... we advance the belief that the hospital problem is not a distinct one that can be treated alone." The editorial cites other health problems of greater immediacy.

25 Years Ago (February 1969)

The Journal prints the text of the second Alex Burgess Lecture, given by Robert Ebert, MD, dean of the Harvard Medical School on the subject of the teaching hospital and the community. The author describes certain tensions between community and teaching hospitals. The community hospital is defined, particularly, as the urban center (such as the municipal hospital) fulfilling the immediate health care needs as they arise. The teaching hospital, while also committed to patient care, assumes responsibilities in medical student and house staff education, research and specialized tertiary care. With the increasing complexity of medical care and the expansion of medical knowledge, the distinctions between one kind of hospital and the other becomes blurred. "Whatever the ultimate involvement of the teaching hospital in the solution of the social problems of medicine, certain facts are apparent: the problems are urgent; there will be increasing pressure for solutions; and change will occur. Let us hope that the solutions are rational and will allow a workable system or systems of high quality comprehensive medical care for all of the citizens of this nation."

Leona Baumgartner, MD, visiting professor of social medicine at Harvard Medical School, offers a paper proposing that better organized medical care will yield happier patients and less hectic lives for physicians. She states: "All of this means that we must do something that we all abhor, namely plan. I don't know why but 'plan' used to be a dirty word in the United States. Planning was thought to be meddling socialization or some other evil thing."

Carleton B. Chapman, MD, and Leona Baumgartner, MD present a statement of

purposes, programs and procedures of the new Tri-State Regional Medical Program (Massachusetts, New Hampshire and Rhode Island).

Louis G. Welt, MD, provides a further paper analyzing the role of the community hospital in fulfilling certain inpatient teaching roles.

Peter L. Mathieu, MD, comments on the role of the solo pediatrician in providing

superior medical care, and education, for the younger patients.

Book reviews on works by H.L. Mencken, Paul de Kruif and Sinclair Lewis are offered by Robert V. Lewis, MD. The contents of *The Constant Circle* (Mencken), *The Sweeping Wind* (de Kruif) and *Arrow-smith* (Lewis) are appraised, and the social relationships among the three authors are described.

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Necrology
1993

Anthony C. Broccoli

Anthony C. Broccoli, MD, 61, of East Greenwich, an ophthalmologist in private practice at Atwood Medical Associates. Johnston, died Dec. 21, 1993 at home after an illness. He was the husband of Bernice (Verdelotti) Broccoli.

Born in Providence, a son of Adelina (Gagliardi) Broccoli of Providence and the late Antonio Broccoli, he lived in North Providence before moving to East Greenwich 22 years ago.

Dr Broccoli graduated from Providence College, received his medical degree from the University of Maryland, Class of 1959, and did his post-graduate work in ophthalmology at Harvard University. He was board certified in ophthalmology and was the first ophthalmology resident at Rhode Island Hospital. He was chief of ophthalmology at St Joseph Hospital, Fatima Unit, since 1970. He also was affiliated with Rhode Island Hospital and Roger Williams Medical Center. He was a veteran of the Coast Guard.

He was a member of the American Medical Association, the Rhode Island Medical Society, the American Academy of Ophthalmologists, the New England Ophthalmologic Society, the Rhode Ophthalmologic Society and the American Society for Cataract Refractive Surgeons. He was on the teaching staff at Brown University. He was a member of the Bishop's Council of St. Joseph Hospital.

Besides his wife and mother, he leaves two daughters, Lauren DeWaele of Lincoln and Carolyn Broccoli of East Greenwich.

J. Wallace Conklin

J. Wallace Conklin, MD, 72, of Cranston, a neurologist in Providence since 1957, died July 14, 1993 at Rhode Island Hospital.

Born in New York, a son of the late J. Wallace and Florence (Lawson) Conklin, he lived in Cranston since 1956. He was a summer resident of Narragansett for 30 years.

Dr Conklin was a 1944 graduate of Brown University, and earned his medical degree at the University of Vermont College of Medicine in 1951.

An alumnus of St Andrew's School, Barrington, he served as a trustee for many years. He also served in a leadership position in its capital fund campaign.

After completing his residency at the University of Minnesota Hospital, and a

fellowship at Friends Hospital, Philadelphia, Pa, he began practice in Rhode Island in 1957. At the time of death, he was a consultant in neurology at Women & Infants Hospital, Rhode Island Hospital, and the St Elizabeth Home. Earlier, he served on the staffs of the Rhode Island Medical Center General Hospital, Miriam Hospital and Roger Williams Hospital.

During World War II, he served with the Army of Occupation in Japan. He was a fellow of the American Academy of Neurology, and a diplomate of the National Board of Medical Examiners, and the American Board of Psychiatry and Neurology. He was a member of the Rhode Island Neurological Society, the Rhode Island Medical Society, and the Providence Medical Association.

Dr Conklin leaves a son, Jonathan R. Conklin of East Greenwich, three daughters, Jennifer Conklin of Cranston, Dr Elizabeth Conklin of Burlington, Vt, Suzanne Conklin of Madison, Wis, and a sister, Audrey Carlton of San Diego, Calif.

Alfred C. Conte, Sr

Alfred C. Conte, Sr, MD, of North Providence, a physician in Providence for 50 years before retiring in 1988, died Sunday at St Joseph Hospital. He was the husband of the late Mary E. (Wood) Conte.

Born in Providence, a son of the late Luigi and Domenica (Fascitella) Conte, he lived in North Providence for 30 years.

Dr Conte graduated from Providence College in 1929 and was a member of its first basketball team. He received his medical degree from Georgetown University in 1934.

He was on the staffs of Roger Williams Hospital, St Joseph Hospital, Providence, and St. Joseph Hospital.

Dr Conte was a 50-year member of the Metacomet Country Club, and a 50-year member of the Aurora Civic Association. He was a past grand knight of St Anthony Council, Knights of Columbus. He was a former member of the Alpine Country Club.

He leaves a son, Alfred C. Conte, Jr. of North Providence; a daughter, Ann L. Conte of Newton, Mass; two sisters, Ann Conte of North Providence, Etta Bicozzi of Providence, and two grandchildren.

Stanley D. Davies

Stanley D. Davies, MD, 87, of Rochester, NY, an obstetrician-gynecologist in

private practice from 1933 to 1985, died March 1, 1993 at home. He was the husband of Catherine (Heelan) Davies.

Born in Paris Station, NY, a son of the late William L. and Alice M. (Head) Davies, he lived in West Warwick since 1933 before moving to Rochester 7 months before his death.

Dr Davies began his medical practice in 1933 on St John Street, in West Warwick. He was a general practitioner with a special interest in surgery and obstetrics from 1933 to 1946. He then limited his practice to obstetrics and gynecology, which he continued until retiring in 1985 at age 80.

He attended the New York State College for Teachers from 1922 to 1923, and its College of Liberal Arts from 1923 to 1925. He was a 1929 graduate of Syracuse University Medical School.

After graduation he was at Syracuse University Hospital as an X-ray resident from 1929 to 1930. He had a rotating internship at Rhode Island Hospital from 1930 to 1931; was a resident in obstetrics at the former Lying-in Hospital, Providence, from 1932 to 1933, and was assistant superintendent at Rhode Island Hospital from 1933 to 1934. He was a former instructor at the Providence Lying-in Hospital for RNs, and also for Tufts Medical School students and residents from 1946 to 1965.

Dr Davies was on courtesy staff at Roger Williams Hospital, Jane Brown unit of Rhode Island Hospital, and Women & Infants Hospital. He was on the associate staff at Rhode Island Hospital, and senior active staff at Kent County Memorial Hospital, where he was the first chief of staff of obstetrics and gynecology. He was named a fellow of the American College of OB-GYN in 1952, a fellow of the American College of Surgeons in 1966, and a fellow of the International College of Surgeons in 1954. He received his certifications from the OB-GYN Board in 1949, the NY State License in 1930, and the RI State License in 1933. He was a member of the Providence Medical Society, the Rhode Island Medical Society, the Kent County Medical Society, the American Medical Society, the New England OB-GYN Society, the Pan Pacific Surgical Society, the American Fertility Society, and the 50-Year Club of American Medicine.

He was a past president of the Kent County Medical Society, the Rhode Island Medical Society, and the New England OB-

GYN Society. He was a trustee of Kent County Memorial Hospital, and a diplomate of the American College of Obstetrics & Gynecology.

Besides his wife he leaves three sons, S. Duane Davies of North Kingstown, William L. Davies of Cincinnati, Ohio, and Jonathan F. Davies, DMD, of Green Oak, Ill.; a daughter, Diane Davies Parrinello of Rochester, a sister, Louise Davies Townsend of Paris Station, and 10 grandchildren.

Joseph J. Delfino

Joseph J. Delfino, MD, 74, of Warwick, a physician in practice for 30 years before retiring in 1978, died July 22, 1993 at Kent County Memorial Hospital after being stricken. He was the husband of Barbara (Moses) Delfino.

Born in Providence, a son of the late Joseph A. and Elizabeth M. (Gilchrist) Delfino, he lived in Warwick for 38 years.

Dr Delfino was a 1938 graduate of the Citadel in Charleston, SC, and a 1940 graduate of Emory University, Atlanta, Ga. He received his medical degree from the St Louis University School of Medicine in 1943. He served his externship with the Alexian Brothers Hospital, St Louis, and at the US Marine Hospital, Norfolk, Va.

Dr Delfino was an Army veteran of World War II. He was licensed in Maine, Virginia, and Rhode Island, and served residencies at DePaul Hospital, Norfolk, Va., and Mercy Hospital, Charlotte, NC. He was a resident at Massachusetts General Hospital and Harvard Medical School in 1948. He was a staff surgeon at the VA Hospital, Augusta, Maine, and then assistant and acting chief of surgery at the VA Hospital, Manchester, NH. He was assistant chief of surgery at the VA Hospital, Brockton, Mass.

In 1954 he entered private practice in Providence. He was on the medical staff of St Joseph and Fatima Hospitals, where he was also a past member of the executive committee. He was also on the staff of Roger Williams Hospital.

Dr Delfino was a consulting surgeon at the General Hospital, Rhode Island Medical Center. He was a member of the Providence and Rhode Island Medical Societies, and former chairman of the Committee on Emergency Services at St Joseph Hospital, Providence. He was active in educational programs in emergency medical service, and was instrumental in promoting EMT training at St Joseph Hospital. He was a member of the Joint American College of Surgeons and a past member of the executive committee of St Joseph and Fatima Hospitals.

Besides his wife he leaves two daughters, Cynthia E. Delfino of Boston, Mass, and Linda M. Delfino of Los Angeles, Calif.

Walter R. Durkin

Walter R. Durkin, MD, 82, of Narragansett, an obstetrician and gynecologist with an office on Angell Street, Providence, until retiring 10 years ago, died October 17, 1993, at home. He was the husband of Claire (Burns) Durkin.

Born in Pawtucket, a son of the late Patrick and Mary (Durkin) Durkin, he lived in Narragansett for a year. He previously lived on the East Side, Providence, for 35 years.

Dr Durkin was a 1933 graduate of Providence College, and a 1942 graduate of Tufts University School of Medicine.

He served his internship at St Joseph Hospital, Providence, and a 3-year residency in obstetrics and gynecology at the Margaret Hague Maternity Hospital, New Jersey. He was the former chief of obstetrics and gynecology at St Joseph Hospital and was on the staff of Women and Infants Hospital and Roger Williams Hospital.

Dr Durkin was a fellow of the American College of Obstetrics and Gynecology, and the American College of Surgeons. He was a member of the Rhode Island Medical Society.

In 1971, he was appointed to the Statewide Health Coordinating Council, which worked with planning the future development of the health care system in Rhode Island.

Besides his wife he leaves two daughters, Rosemary Younes of Narragansett, and Cairo. Egypt, Stephanie Stevens of Wickford, and two granddaughters.

Banice Feinberg

Banice Feinberg, MD, 92, died March 10, 1993 at the Jewish Home for the Aged, Providence. He was the husband of the late Laura (Sydney) Feinberg.

Born in Brooklyn, NY, a son of the late Morris and Ida (Goldberg) Feinberg, he had lived in Providence since 1925, when he established his private pediatric practice.

Dr Feinberg was chief of pediatrics at Rhode Island Hospital from 1955 and was a consultant for departments of pediatrics and pediatric cardiology at local hospitals.

He graduated from Tufts Medical School in 1922 and did his internship and residencies at Beth Israel Hospital in Boston, the Boston Floating Hospital, C.V. Chapin Hospital in Providence, New York Nursery and Child's Hospital and the Bellevue Pediatric Service, both in New York City.

He was on the Certified American Board of Pediatrics in 1936, a fellow of the American Academy of Pediatrics and a member of the section of Pediatric Cardiology, American Academy of Pediatrics. He was a

fellow of the College of Chest Physicians.

He was founder and president of the Children's Heart Association, 1941 to 1943; president of the Rhode Island Heart Association in 1957; national chairman of the Committee of School Health and Health Careers, American Heart Association, 1958 to 1961; president of the New England Pediatric Society in 1961; and state chairman, American Academy of Pediatrics, 1959 to 1962.

The American Heart Association, Rhode Island Affiliate, renamed the annual Physician of the Year Award in honor of Dr Feinberg.

Former Gov. Edward D. DiPrete proclaimed March 10, 1985, as Dr Banice Feinberg Recognition Day for his many years of caring for children with birth defects.

He leaves two sons, Albert S. Feinberg of Sudbury, Mass, and Lloyd J. Feinberg of Great Fall, Va; one daughter, Helen Z. Schneider of Delray, Fla; seven grandchildren; and two great-grandchildren.

A. Henry Fox

A. Henry Fox, MD, 94, of East Providence, an internist in private practice in Riverside for 54 years before retiring 8 years ago, and on the staff of Rhode Island Hospital for many years, died July 6, 1993 at the hospital.

Born in Russia, a son of the late David and Sarah (Zonis) Fox, he lived in Boston before moving to Riverside 62 years ago.

He was a 1922 graduate of Harvard College, and a 1928 graduate of the Boston University School of Medicine.

In 1982, the staff of the Department of Medicine at Rhode Island Hospital celebrated a Medical Grand Round in Dr Fox's honor, a unique event in the hospital's history because it was dedicated to a physician in private practice for 51 consecutive years.

A colleague, Dr Milton W. Hamolsky, recalls him with respect and affection. "One of Dr Fox's personal commitments was the study and treatment of cancer. At 75 he was still excited by new medical developments. He would still read the medical journals, and also counsel the interns and residents. He was an amazing diagnostician, probably because he had practiced for such a long time and was so dedicated to his craft and to his patients."

Dr Fox leaves a sister, Hilda Kalish of Silver Spring, Md.

Louis J. Fuhrmann

Louis J. Fuhrmann, MD, of Hulmville, Pa, an obstetrician who practiced in Rhode Island for many years before retiring, died August 8, 1993, at home. He was the husband of B. Ruth (Fairfield) Fuhrmann.

Born in Trenton, NJ, a son of the late Peter Christian and Leila I. (White) Fuhrmann, he had lived in Providence for most of his life, moving to Pennsylvania when he retired.

Dr Fuhrmann was a 1928 graduate of New York Polytechnic and Hahnemann University Hospital Medical Schools.

He was chief of obstetrics at Roger Williams Hospital for many years. During his practice he delivered more than 6000 babies in the Providence area. He was a member of the American Medical Association. During World War II, Dr Fuhrmann did work for the draft board.

Besides his wife, he leaves two daughters, Ruth L. Sherrill of Ft. Meyers, Fla., and Linda F. Werner of Southampton, Pa., and four grandchildren.

Isadore Gershman

Isadore Gershman, MD, 80, of Providence died November 23, 1993, at Hospice Care of Rhode Island, Philip Hultar Inpatient Facility. He was the husband of Helen (Brososky) Gershman.

He was born in Providence to the late Benjamin and Rose (Cohen) Gershman.

Dr Gershman was a 1935 graduate of Brown University and received his medical degree from Jefferson Medical College, Philadelphia, Pa, in 1938. He was a member of the Rhode Island Medical Society, and the Providence Medical Association. He was a fellow of the American Academy of Pediatrics and a licentiate of the American Board of Pediatrics.

His articles were published in the *New England Journal of Medicine*, the *American Journal of Diseases of Children*, and the *Rhode Island Medical Journal*. He was an instructor in pediatric diagnoses at the Brown University Medical Program, and was Chief of Service and Chief of the Outpatient Department at St. Joseph Hospital. He was on the pediatric staff at Rhode Island Hospital, Roger Williams Hospital, Miriam Hospital and Women and Infants Hospital. He was president of the staff and assistant clinical director of the former Charles V. Chapin Hospital.

In the 1960s and 1970s, Dr Gershman was instrumental in organizing and staffing neighborhood clinic pilot programs in Providence and North Providence that were under the auspices of Project Head Start. He was a supporter of the medical programs in Israel and a member of the American Physicians Fellowship for Israel.

An Army veteran of World War II, he served as a captain and medical officer in an anti-aircraft unit in England and France.

Besides his wife he leaves a son, James Gershman of Cranston; a daughter, Sherry

Stephens of Danville, Calif; a sister, Mollie Sindle of Providence, and 2 grandchildren.

Peter F. Harrington

Peter F. Harrington, 83, of Providence, chief of staff at Zambarano Hospital, Burrillville, from 1978 to 1988 before retiring, died March 22, 1993, at Community Hospital, Naples, Fla, while at his winter home in Marco Island, Fla. He was the husband of Geraldine (Daniels) Harrington. He was also the husband of the late Mary G. (McNulty) Harrington.

Born in Fox Point, Providence, he was a son of the late Timothy and Mary (Ward) Harrington.

Dr Harrington was a *summa cum laude* graduate of Providence College in 1931. He received his medical degree from Georgetown Medical School, Washington, DC. He studied in Boston under Dr Paul Dudley White, and also Dr Richard Overholt, who pioneered chest surgery in the 1930s.

Dr Harrington assisted him in the first operation that involved surgical instruments fashioned by a master machinist during the course of the operation, at Dr Overholt's instructions.

Recognized as one of the first physicians in the country to support municipal clinics in the control and spread of tuberculosis, he established the Chapin Hospital Tuberculosis Clinic in 1940 and served as its director. He was most proud of the closing of that clinic in 1972 because of the elimination of TB, in that period of time, from the Greater Providence area.

During World War II, he served as chief of the Rhode Island Civil Defense Medical Corps. In 1969, he volunteered his services in Kenya, Africa, with the mission of the Holy Ghost Sisters of Ireland.

He was cited by President Eamon DeValera of Ireland for his contributions to medicine. He was past president of the New England College of Chest Physicians and served on the board of the American College of Chest Physicians.

Besides his wife he leaves three sons, Peter F. Harrington Jr. of Newton, Mass, MAJ David J. Harrington, USMC retired of Cooperstown, NY, and Thomas G. Harrington of Margurita, Venezuela; three daughters, Mary W. Holmes, RN, of Warwick, Ann H. Brockett of Dallas, Texas, and Frances P. Lapetina of Newport; a stepson, John D. Conlon of Rochester, NY; two stepdaughters, Geraldine Travers, and Patricia Moran, both of Farmington, Conn; 21 grandchildren, and 7 great-grandchildren.

Hubert Holdsworth

Hubert Holdsworth, 77, of Bristol died April 5, 1993 at home after a 4-year illness.

He was the husband of Frances (Sartwell) Holdsworth.

Born in Smithfield, he was a son of the late Fred and Fanny (Collins) Holdsworth.

Dr Holdsworth was a 1936 graduate of Brown University, and a 1940 graduate of Tufts University School of Medicine. He was a captain in the Army during World War II and served in the China-Burma-India and Pacific-Theaters. From 1943 to 1945; he served with the 48th Evacuation Hospital.

From 1945 to 1987, he maintained a practice in Bristol. He on the staff of Rhode Island Hospital. In 1988 he received the Irving A. Beck Laureate Award as "Doctor of the Year" from the Rhode Island Chapter of the American College of Physicians.

Besides his wife he leaves two daughters, Nancy Weaver of Barrington, and Jane Zora of Marion, Mass; a brother, Renee Levine of Leominster, Mass, and three grandchildren.

Anthony Iavazzo

Anthony Iavazzo, MD, 92, of Cranston, a physician for 47 years before retiring, died Aug. 15, 1993, at Rhode Island Hospital. He was the husband of Mary (Testa) Iavazzo.

Born in Pawtucket, a son of the late Emilio and Angelina Iavazzo, he lived in Cranston for 13 years. He previously lived in Providence for 47 years.

Dr Iavazzo attended Harvard University and Boston University School of Medicine.

From 1931 to 1933, he interned at Cambridge General Hospital. In 1933, he opened his practice at 177 Pocasset Ave., Providence. In 1939, he moved his practice to 277 Laurel Hill Ave., Providence, and retired in 1980. From 1950 to 1968, he was the chief state immunologist.

Dr Iavazzo was physician for all the societies at St. Bartholomew Church, Providence.

Besides his wife he leaves two sons, Dr Ronald E. Iavazzo, Emile R. Iavazzo, and a sister, Eva Petrucci, all of Cranston.

John K. Lury

John K. Lury, MD, 76, of Cranston, a physician who practiced in Providence for 40 years until retiring 6 years ago, died November 28, 1993, at home. He was the husband of Frances (Cokin) Lury. Born in Providence, a son of the late Frank and Freda (Gutsky) Lury, he lived in Cranston for 40 years.

Dr Lury graduated from Providence College and received his medical degree from St Louis University School of Medicine. He served his internship at St Joseph Hospital, Providence and has been on the staffs of St Joseph, Miriam and Charles V.

Chapin Hospitals.

During World War II, he served as a battalion surgeon in the Army in the European Theater for 3 years, and held the rank of major when he was discharged at the conclusion of the war.

He was a fellow and charter member of the American Academy of Family Physicians. He was a member of the American Medical Association, the Rhode Island Medical Society, and the Providence Medical Society.

Besides his wife he leaves 2 sons, Dr Frederick S. Lury of East Greenwich and Dr Kenneth M. Lury of Jacksonville, NC; 2 sisters, Frances Cohen of Providence and Martha Revkin of Cranston; a brother, Harris L. Lury of Warwick, and 4 granddaughters.

Frederic W. Ripley, Jr

Frederic W. Ripley, Jr., MD, FACOG, 84, of East Providence, a retired obstetrician and gynecologist whose practice was on Waterman Street, Providence, died June 29, 1993 at Rhode Island Hospital. He was the husband of the late Miriam "Mimi" H. (Day) Ripley.

Born in Providence, a son of the late Frederic W. Ripley, Sr., and Emily (Richardson) Ripley, he lived in Rumford most of his life.

Dr Ripley was a 1932 graduate of Brown

University and a 1936 graduate of Tufts University School of Medicine.

He interned from 1936 to 1937 at Newton-Wellesley Hospital, and was a resident in ob-gyn/pathology at Boston Lying-in Hospital from a 1937 to 1938, and was the chief resident there from 1940 to 1941.

Dr Ripley was an assistant instructor of ob-gyn at Harvard Medical School from 1952 to 1962, and a clinical instructor of ob-gyn at Tufts University School of Medicine from 1952 to 1964. From 1972 to 1974, he was an associate professor in ob-gyn at the Brown University School of Medicine.

He was on the staff of the former Providence Lying-in Hospital, now Women & Infants Hospital, from 1942 to 1985. He served as chief of staff at the hospital from 1964 to 1969, and on the senior consulting staff from 1969 to 1985. He was on the emeritus consulting staff of the hospital from 1986 to the present. He served on the staff of Rhode Island Hospital from 1942 to 1964 and was on the hospital consulting staff from 1964 to 1985. He was a surgeon at Rhode Island Hospital from 1956 to 1964. He was a consultant at Roger Williams Hospital from 1965 to 1985, and emeritus from 1986 to the present. He was a consultant at the former Charles V. Chapin Hospital from 1942 to 1964, Butler Hospital from 1950 to 1985, and Woonsocket Hospital

from 1961 to 1985.

Dr Ripley was president of the RI division of the American Cancer Society from 1963 to 1966, a director from 1951 to 1967, and from 1970 to the present. He was a founding fellow of the American College of Obstetricians and Gynecologists in 1951. He was a member of the American College of Obstetricians and Gynecologists, and the Obstetrical Society of Boston.

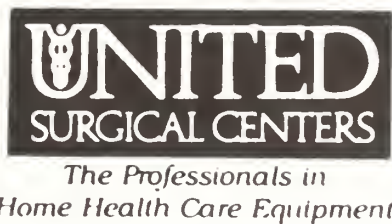
Dr Ripley was a contributor to various obstetrical-gynecological publications.

He leaves two daughters, Penny R. Olsen of Rockport, Mass, and Pamela A. Berube of Rehoboth, Mass; a son, Frederic W. Ripley III of Natick, Mass; and five grandchildren.

Bertram Selverstone

Bertram Selverstone, MD, 76, of Providence, a neurosurgeon and clinical professor-emeritus of neurosurgery at Brown University, died March 20, 1993, in Boston. Born in Augusta, Ga a son of the late Louis and Agnes Selverstone, he lived in Providence for many years. He was a 1937 graduate of Columbia University; and received his medical degree from the Harvard Medical School in 1941. He served his internship and residency at McGill University Hospital, and the Montreal Neurological Institute from 1941 to 1943. During World

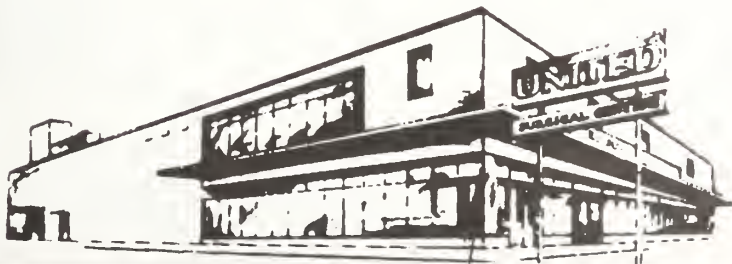
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War II, he served as a captain in the Army Medical Corps at Walter Reed General Hospital, DeWitt General Hospital, and the Letterman General Hospital.

Dr Selverstone pioneered in the radioactive localization of brain tumors and the surgical control of cerebral aneurysms. He invented the Selverstone Carotid Clamp, which is used to control blood flow through the carotid artery.

He served as president of the New England Neurosurgical Society from 1961 to 1962, and the Neurosurgical Society of America from 1966 to 1967. He received the Award of Honor from the Society of Nuclear Medicine in 1974 for pioneering the use of radionuclides and for contributions to nuclear medicine. He was a member of the Xeiron Society.

Upon leaving military service, he joined the faculty of Harvard Medical School, and also served as chief resident in neurosurgery from 1946 to 1947, and clinical assistant from 1948 to 1951 at Massachusetts General Hospital. From 1951 to 1970, he was professor of neurosurgery at Tufts University School of Medicine and neurosurgeon-in-chief at the New England Medical Center Hospitals.

He moved to Providence in 1970 to establish a private practice. He was appointed clinical professor of neurosurgery at Brown University in 1971, and became clinical professor-emeritus in 1985.

He leaves three daughters, Joan Selverstone Clark of Encino, Calif, Judith Selverstone Shaw of Canton, Conn, and Laura Gordon of South Woodstock, Vt; a son, Peter Selverstone of Arlington; two brothers, Dr Louis A. Selverstone, MD, of Boston, Dr Norman J. Selverstone of Cambridge; and five grandchildren.

Stanley D. Simon

Stanley D. Simon, MD, 77, of Providence, a former chairman of the medical board at Miriam Hospital and active in a variety of civic and community causes for nearly 50 years, died August 1, 1993 at his summer home in Wellfleet on Cape Cod, Mass. He was the husband of Marion (Faggen) Simon.

Born in New York City, he was a son of the late Louis and Ray (Mishkin) Simon.

During World War II, he served as a physician at the Marine Corps Air Station at Cherry Point, NC, then the Brooklyn Naval Yard and finally was assigned to an escort ship based in Newport.

After his honorable discharge in 1948, he and his family settled in Rhode Island.

For many years, he maintained a practice as an orthopedic surgeon with offices on Wayland Avenue on the East Side, then joined the Orthopedic Group in Pawtucket, with which he was associated until his retirement in 1987.

Dr Simon was a past president of the Providence and Rhode Island Medical Societies, a past chairman of the Medical Economic Committee of the Rhode Island Medical Society, and a former board member of Blue Cross and Blue Shield of Rhode Island.

In 1966, Mayor Joseph A. Doorley Jr., named Dr Simon to the first appointed School Board in the city, and Dr Simon served in that post for 10 years.

Besides his wife, he leaves a son, Dr Peter R. Simon, administrator of the division for Children with Special Health Care Needs in the state Department of Health; a daughter, Patricia Schwadron of Los Angeles; a son-in-law, Terry Schwadron, a managing editor of the Los Angeles Times; a daughter-in-law, Toby D. Simon, associate dean of students at Brown University; and six grandchildren.

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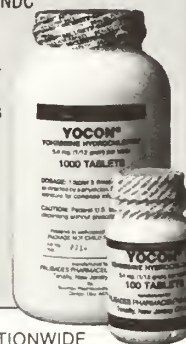
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.^{1,3,4} 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.³

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References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
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4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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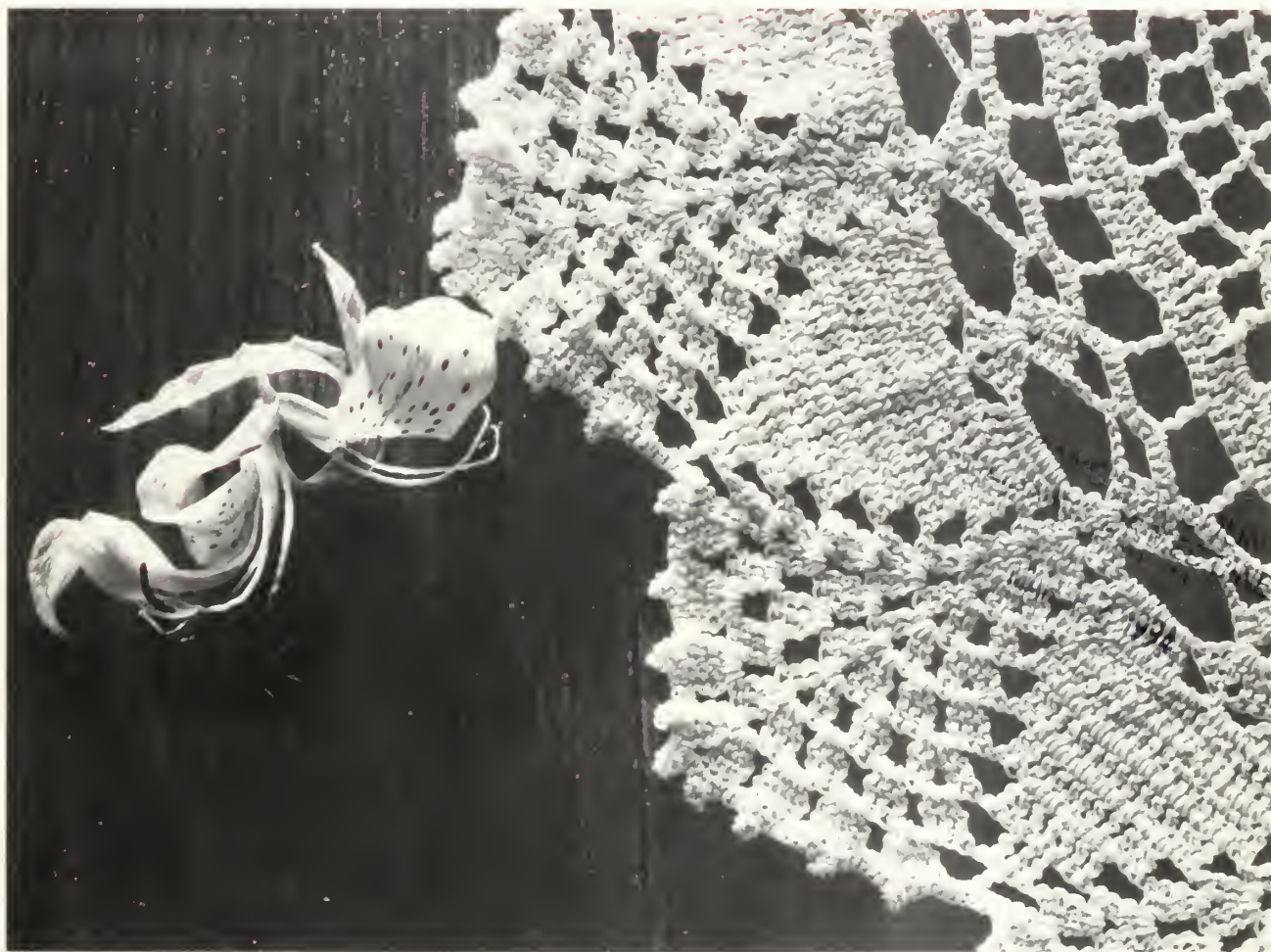
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The Human Context of Medical Education

Recent debate concerning the challenges facing medicine has focused on access to health services, the structure for financing care, and the consequent necessity for reform of medical education. It is important, however, to remember that individuals make up the system.

What kinds of people decide to study medicine and what factors motivate them to do so? Moreover, how do they personally feel about the process of becoming physicians? RHODE ISLAND MEDICINE has devoted this issue to airing students' perspectives, to examine a spectrum of their views and experiences.

Perceptions of pre-medical students by themselves and by others are frequently negative. Pre-medical students are stereotyped as being too competitive, exceedingly concerned about grades and of pursuing an educational curriculum that is too narrowly focused on medical school admission. Similarly, medical students are seen as being too concerned about earning a competitive residency slot after graduation and with choosing a specialty based on prospective financial gain. While examples can be found to support such views, experiences with students in the Brown University School of Medicine lead one to assemble quite a different profile of them. Since the Program in Liberal Medical Education (PLME) is a non-accelerated, 8-year continuum encompassing both the baccalaureate and medical degrees, there is ample opportunity to view first-hand how our students frame their studies.

The student articles published in this issue demonstrate only a fraction of their activities: volunteer work, community service and special projects; laboratory and clinical research; contacts with physicians and health programs in communities; working to improve the educational experience;

trying to ease the illness experiences for patients and their families; sharing their thoughts about medical education and about illness through essays and poems; mentoring other students through the process, and so on. With this issue, we share students' thinking and work with the larger medical community.

The article on student development describes one approach used at Brown to promote students' responsibility for their education and personal growth. The other articles are student submissions.

Many imperatives for our students can't be found in these pages: special programs and groups on issues of gender and on issues of cultural diversity; work with the curriculum committee and the new competency collegia; contributions to course and program development; regional and national activities in the various medical and educational group medical student affiliate groups; work with the health department, the school system and other community agencies; concert level musical performances; participation in programs for the homeless and other services during free time and holidays; and the list goes on. We have come to expect much from our students in the Brown School of Medicine and they continue to exceed our expectations.

The following colleagues have aided me in reviewing, selecting and editing the student contributions for this issue of RHODE ISLAND MEDICINE: Debra B. Abeshaus, director, PLME Student Affairs and Office of Women in Medicine; Lucile F. Newman, PhD, professor of community health; Peter R. Shank, PhD, professor of medical science and associate dean of medicine in biological sciences and research; and Sally Zierler, DrPH, associate professor of community health.

Lynn C. Epstein, MD
Associate Dean of Medicine
Student Development

Glandular Semantics

Glands, ductless or otherwise, were given names long before their functions had been clarified. Their anatomic names evolved, therefore, from such secondary characteristics as their proximity to other organs (eg, adrenal, parotid), their shape (eg, thyroid, thymus, pineal), their composition (eg, pancreas), or what they were thought to elaborate (eg, pituitary). Only the gonads were provided with names suggesting that their true functions were appreciated.

Some of the glandular organs (or their secretions) bear both Latin and Greek names (eg, pituitary and hypophysis; adrenaline and epinephrine) as well as names derived from vernacular speech. Given the utter perplexity surrounding the purpose of these glands, these given names remain singularly free of any metaphoric or mythological taint.

The word gland, incidentally, is taken from the Latin, *glans*, signifying a resemblance to an acorn. The imaginative Celsus, writing in the first century, believed that the distal end of the penis also looked like an acorn and hence he called this segment the *glans*.

The adrenal gland derives its name from the Latin, *renalis*, pertaining to the kidney, and the prefix *ad-*, meaning in the direction of. An archaic English word for the kidney is *reins*; and in Biblical use this word was equivalent to the term "loins," denoting the anatomic site where both kidneys and feelings were believed to be stored (cf. Proverbs 23:16, Job 19:27). The adrenal gland is also called suprarenal capsule in British texts.

Thomas Addison's 1855 paper, "On the Constitutional and Local Effects of Disease of the Supra-Renal Capsule," opens with this observation: "It will hardly be disputed that at the present moment the functions of the suprarenal capsules, and the influence that they exercise in the general economy,

are almost or altogether unknown." He then describes a novel disorder, later to be called Addison's disease, in a patient with adrenal degeneration and exhibiting the following clinical characteristics: "anaemia, languor, failure of appetite, feebleness of the heart, discoloration of the skin (shades of deep amber or chestnut-brown) and body wasting . . . the patient at length gradually sinks and expires." Addison presumed that an intact adrenal gland, therefore, must continuously elaborate some active substance preventing the appearance of these clinical signs. Destruction of the glands, then, would inevitably lead to the array of signs and symptoms that he observed.

The thyroid takes its name from the Greek *thyreos*, meaning shield-shaped; and the Greek suffix *-oid*, meaning a resemblance to. The function of this ductless gland was by degrees inferred from the historic association between endemic cretinism (as seen in alpine, tyrolean and pyrenean isolates) and enlargement of the organ (ie, goiter). The name, goiter, in turn, was derived from the Latin, *gutturiosum*, meaning throat. Crude extracts of animal thyroid were shown to reverse the effects of myxedema (1891) and cretinism (1892). An earlier name for myxedema was athyrea.

Thymus is named for its alleged resemblance to the buds of thyme, an aromatic herb of Mediterranean origin with leaves rich in fragrant oils, a member of the mint family. The Greek name for thyme derives from a more primitive word meaning sacrifice. The thyme plant, in ancient Greece, had been employed as incense in sacrificial fires. The oil expressed from thyme (called thymol) is still used for its antiseptic and antihelminthic properties.

The parotid has a notably neutral name telling the listener that the organ is situated beside (Greek, *para-*) the ear (Greek, *otos*), something that any child with mumps could tell you. The pineal, said to resemble a pinecone, had been accordingly given the Latin name, *pineal*. The pancreas, an organ without a capsule and a preferential source of food (sweetbreads), was named from the Greek words meaning all (*pan*) and flesh (*creas*). The carotid body, incidentally, derives its name from the Greek word *karos*, meaning "stupor," and stems from the primitive clinical observation that prolonged carotid artery compression induces stupor.

The enigmatic pituitary gland was thought to generate mucus (" . . . the phlegmaticke glandule") and hence was named from the Latin *pituita*, meaning slime. The Greek name for this small gland situated below the brain, hypophysis, is a compound word with a prefix (*hypo-*) indicating "be-

neath," and a root (*physis*) meaning "nature" or "life," as in such words as physiology, symphysis and metaphysics.

The prostate is descended etymologically from the Latin *pro-*, in front of, and the root, *stata*, to stand (ie, to stand before the bladder). The similarly sounding word prostrate, on the other hand, has its origins in the Latin *pro-*, and *stratus*, to throw down (ie, to lie horizontally). A third word, prostitute (Latin, *pro stitutus*) is also kindred to the word prostate in that it signifies the placing in front of or exposing publicly.

The ovary derives its name from the Latin *ovarium*, a place for eggs. The word testis, however, is from the Greek word meaning male gonad or witness. The conjunction of these two widely disparate meanings may be found in a primitive Mediterranean custom whereby adult males were required to grasp their genitals when swearing (literally, testifying) before some tribal tribunal. Thus, words of currently diverse meanings (testicle, testimony, intestate, testament) all had their roots in a common ancestor. Because of this, some Latin rules of canonic law such as "*testis unus testis nullus*" (ie, one witness is no witness) may be susceptible to wildly inappropriate or feeble translations.

Stanley M. Aronson, MD

The Language of Epidemiology (XVII): Randomized Clinical Trials

The adjective, *random*, is seldom used randomly. In nonscientific writings, particularly, it tends to define events that are viewed as haphazard, reckless, even dangerous. Thus, we hear of a pedestrian struck by a *random* bullet; but never do we read that this same pedestrian *randomly* won a state lottery. A little couplet by Marquis seems to capture the commonly held feeling that randomness is on the menacing side of happenings:

Now and then there is a person born
who is so unlucky
That he runs into accidents which started
out to happen to somebody else.

We give a negative tilt to randomness. Our selective memories recall for us all the bad things that seem to happen to good people; and, of course, all the good things befalling the wicked. We may label such outcomes as capricious fate, cruel destiny or just bad luck; but whatever the words we choose, we are persuaded that a loaded crapshoot rather than a balanced, compassionate justice determines our outcomes.

Our misfortunes we sometimes collectively call experience. Goethe, stressing the obvious, noted that experience is only one-half of experience. To the objective observer, randomness describes both good and bad outcomes; but to the myopic, randomness is ever the enemy.

And yet, random (chance) accidents—as Marquis points out—indeed seem to happen more commonly to some than to others. One of Pasteur's great aphorisms was: "Chance favors the prepared mind." He was, of course, referring to the non-randomness of great discoveries, that a quirky laboratory finding might be disclosed to a score of independent scientists, but only the one with the prepared mind will see its true relevance. Epiphanies, he believed, don't come cheaply. When, conversely, the outcome is disease rather than discovery, bad outcomes may again befall some more frequently than others. The facilitating factor (now called risk-factor) might be, perhaps, some unobtrusive genetic difference or a prior but independent disability. All pedestrians, for example, run some risk of being hit by speeding cars; the pedestrian befuddled by alcohol (the risk factor) runs a substantially greater risk. To paraphrase Pasteur, "Chance (randomness) favors the more vulnerable ones."

Random is a word of Germanic origin and originally signified an uncontrolled rushing or flowing. Before the 14th century it conveyed the sense of something propelled in a straight line, as perhaps, a stream or a missile. Its meaning then gradually broadened to suggest a lack of design or purpose, a haphazardness. The straight line imagery changed to a path of erratic events, mindless, impetuous, unpredictable, and totally lacking in aim or purpose. Increasingly, too, the word carried a feeling of imminent danger—that chance in this hazardous world was indeed a chancy thing. And while the word "random" could theoretically convey a spectrum of feelings ranging from happy-go-lucky happenstance to alien threat, for the most part it tended toward the more shadowed meanings. Shakespeare's Henry VI says: "He talks at random. Sure the man is mad."

In recent decades a newer, more arithmetical and therefore more neutral, meaning for random has emerged. Something described as random can now be considered to possess an absence of bias, with the probability of any one outcome neither more—nor less—than that for any other element in a particular set of equal possibilities. In prior centuries, the word random had portrayed such things as havoc, punishments, thoughts and even harvests; current-

ly, it defines such matters as statistical samples and variations around an arithmetic mean.

What role does *random* play in epidemiology?

When a new drug is thought to prevent, mitigate or cure a particular illness, we may verify this by a number of methods. For example, we may place trust in scattered anecdotal evidence or uncontrolled human trials said to demonstrate the efficacy of the medication; we might rely upon a pharmacologic analogy (ie, the new agent has a molecular structure similar to another agent previously proven to be effective); we might give credence to animal experimentation; but most physicians (and drug companies) will now turn to the gold-standard procedure used to demonstrate drug efficacy—the randomized clinical trial (RCT). These widely used formal trials are designed to answer the question: is the use of this agent in patients with a verified abnormality more helpful than without its use?

Assume that a new drug is proposed for the treatment of rheumatoid arthritis. A randomized clinical trial is then designed involving adequate numbers of participating individuals with verified rheumatoid arthri-

tis. These individuals are divided into three or more treatment groups: A group receiving an agent, such as a nonsteroidal anti-inflammatory drug, known to have some measurable effect upon rheumatoid arthritis; a group receiving a placebo; and a group receiving the new, unproven agent. All the medications are disguised so as not to be distinguishable by taste or other characteristic. The following three rules form the basis for an RCT:

1. Each participating subject has an equal chance of being selected for any one of the three treatment groups. The allocation of patients to the treatment groups is customarily determined by some objective selection mechanism.
2. To insure the randomization of the groups (ie, to diminish the role of random variation in each sample), a prior distribution of the rheumatoid arthritis pool into subgroups (ie, stratified by age, ethnicity and sex) is undertaken such that the compositions of each of the three treatment groups will be comparable in terms of such known variables as gender, age and ethnicity.
3. Since bias may be exerted in many sub-

tle, even subconscious, ways neither the patients nor those providing the outcome evaluations shall know the identity of the medications given (ie, double-blinding).

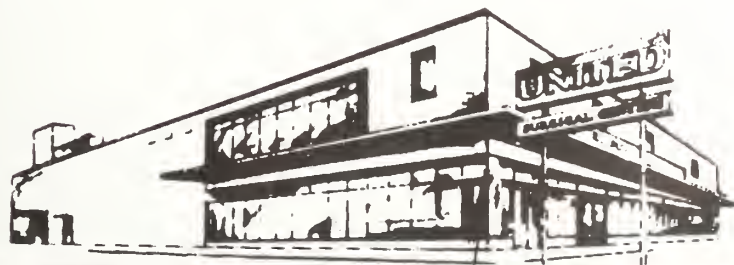
The art of medicine is compounded of compassion, accumulated experience, openness to new ideas, and an appreciation of the patient's unique needs. The science of medicine, on the other hand, requires an objective and disciplined capacity to study new information and to apply rigorous scientific criteria when choosing one or another new intervention said to prevent, abate or cure a particular disease. Some new agents, such as penicillin or insulin, were shown to be effective without elaborate field-testing schedules. But the merits of most new agents are not as dramatic, and the measure of their effectiveness is often visible only after lengthy intervals of controlled observation. For the majority of new therapeutic agents, then, a reliable testing protocol is needed, a procedure which is both ethically acceptable and sensitive enough to detect small therapeutic improvements. The randomized clinical trial is, thus far, our best method.

Stanley M. Aronson, MD

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Brief Essays by Brown Medical Students

These six short commentaries, covering a variety of personal observations, have all been submitted by students currently enrolled in Brown University's continuum of medical education. They vary in subject matter from a study on the risk factors for alcoholism among New Jersey migrant farm workers to the feelings of futility and fulfillment that caring for an AIDS patient may engender. There is, in these writings, an earnestness, commitment and candor that few of us can recall during our days of undergraduate medical education.

Alcohol Use Among Migrant Farm Workers In New Jersey*

Joanne Wilkinson

Joanne Wilkinson comes from Providence, where she graduated from Lincoln School ('87) and Brown University ('90). She is a 3rd-year medical student and hopes to go into family medicine.

Little is known about the health and well-being of the roughly 5000 migrant workers serving the farms of South Central New Jersey. This migrant stream is composed mostly of single males who have traveled to the area with friends or other male relatives. The previously large number of Puerto Rican workers has been displaced by an influx of Mexican workers, with a small but growing number of Guatemalans and nuclear families traveling together. Social, cultural and economic factors, combined with some prior clinical observations, indicate that alcoholism is a problem for this group.

This project was designed to document baseline levels of alcohol use in this migrant community and to correlate alcohol abuse with risk factors such as levels of education, marital status and age. These risk factors are considered powerful predictors in the white American male population; this project

aimed to find whether they are equally strong in this group, and if they are not, which demographic characteristics are most predictive of alcohol abuse.

Methods

To collect data on the migrant workers, two medical students doing a National Health Service Corps project in 1991 adapted a WHO Spanish-language questionnaire originally designed to document alcohol use in Latin America. It was administered to 50 farm workers the following summer by a student doing a similar project at more than a dozen local migrant camps. Alcohol use was defined as a score on a scale from 0 to 18, then grouped into low, moderate and heavy alcohol use, with the last group constituting alcohol abuse. This variable was then correlated with age, marital status, ethnicity, education level, camp size, general health, tension levels, reported symptoms, proximity of family and close friends, history of alcoholism in the family and smoking.

Findings

Alcohol abuse was twice as prevalent in the study population as in the general population (38% in the migrant group as opposed to reports of 19% to 20% in the US population). The results also showed that traditional variables associated with high risk for alcohol abuse, such as education level and family history, are poor predictors for this group. Instead, the most powerful predictors of heavy alcohol use were camp size and the presence of family members in the camp. Camp size was defined as small (fewer than 12 migrants at 1 farm) or large (more than 12). This binary separation seemed logical since all the camps included in the study were either quite small, about 5 to 10 men, or large, with 30 or more men. There was no need for an intermediate category. Migrants from small camps were significantly less likely to be heavy alcohol users compared to migrants from large camps. The presence of family members in the camp was defined as a positive answer to the question, "Is someone from your family, like a father, brother, uncle or cousin, living here with you?" Migrants who

responded positively were significantly less likely to abuse alcohol than those who had no family members in the camp.

Discussion

This project's purpose was two-fold: first, to document baseline levels of alcohol use in the Hispanic migrant populations and second, to correlate alcohol abuse with demographic variables so that health care workers in the area could identify those at increased risk.

The findings indicate that alcohol abuse in the migrant population of New Jersey is about twice as prevalent as in the general population and that the variables traditionally used to predict increased risk of alcohol abuse in white American males are not predictive in this group. Rather, demographic characteristics of the migrant lifestyle, notably the size of the camp and the lack of family members in the camp, are the strongest predictors of risk. Future efforts at reducing alcohol abuse and treating alcoholism would be targeted more efficiently at the larger camps, and clinical questions designed to evaluate the patient's risk can be specifically geared toward those characteristics that have been shown to be predictive of increased risk.

Health Care in Rural Taiwan

Tzu-Ying (Tammy) Wu

Born in Taiwan, Tzu-Ying (Tammy) Wu came to the US 11 years ago and has now spent an equal number of years in Taiwan and in the US. Tammy was accepted to the PLME program at Brown and received her undergraduate degree in biochemistry and is continuing her studies at Brown. She is now a 1st year

ABBREVIATIONS USED

AIDS: Acquired Immune Deficiency Syndrome
CT: Computerized tomography
GPC/HS: Group Practice Center/Health Station
WHO: World Health Organization

* The author is preparing a longer manuscript, incorporating the quantitative findings on this project.

While finishing the last final examination of my 3rd undergraduate years, I found it hard to concentrate on answering questions about neurons, dendrites, and all the wonderful things they do. I was restless and excited. "After this one, I'll be done!" I thought. "Really done! No more exams (for at least 8 months anyway). I am going to..." My mind drew a blank as I thought about what I would do with the time that I was going to have by taking my last semester off. I didn't have a solid plan; however, I knew I wanted to relax, be with my family (whom I usually see only during summer and winter breaks), and do things that I haven't had the time for. So, I took off for Taiwan.

During the first 4 months away from Brown, I rekindled my interest in piano and music and traveled to Hong Kong and China for the first time. Best of all, I turned my affinity group project* into one of the most memorable and treasured experiences of my life.

I visited the remote areas of Ping-Hsi and Chinshan in Taiwan where medical service had been lacking until the recent establishment of a group practice center/health station (GPC/HS). Many GPC/HSes have been installed since 1982 by Taiwan's Ministry of Health to improve rural residents' living standards and health care. My project was to learn about the organization and functions of each GPC/HS and to observe the doctor-patient relationships.

At the GPC/HS located in the mountainous regions of Ping-Hsi, most patients consist of the elderly and the newborn. This patient mix can be explained by the history of Ping-Hsi, which used to be a booming town when the coal mine industry was at its peak. Since the decline of the coal industry, most people, particularly the younger and stronger, have migrated elsewhere seeking better jobs, leaving the older generation of former coal miners behind. In contrast, Chinshan, where commercial fishing and agriculture flourish, has only begun its transformation into a modern society of commerce and tourism. The patients of the Chin-

shan GPC/HS consist of residents of all ages and their health problems also run a wider gamut.

At both GPC/HSes, the physician is the health care provider and a respected friend in whom patients confide. There I sensed the noble quality of the doctors truly willing to listen and spend time with their patients and to help them understand their medical problems. The patients, too, showed sincere appreciation for the knowledge and care that their physician offered. It was exhilarating to see the patients' satisfied expressions upon leaving the GPC/HS knowing that they would return healthier to chat with the doctor and the nurses about their crops or business as usual.

Besides making better health care more accessible, the GPC/HS seeks to educate the inhabitants of these remote areas about preventive care, food and environment sanitation, family planning, and maternal and child care. This program includes home visits by the public health nurses, meetings in town with speakers from supporting teaching hospitals to discuss problems endemic to the area, and educational videotapes distributed to the local schools. All these activities have received positive responses from the rural residents and have helped to improve their living conditions significantly.

Nothing is more exciting than actually being there at the site of the happening and experiencing the event. As I stayed by the physician's side and observed and trotted along the winding country roads with the nurses making home visits, I thought about the value of primary care. It is the essence of health care, the very basis on which physicians in both Western and Eastern cultures have established the reputation of noble caring for all. Being a medical student at Brown brings me one step closer to realizing my goal of becoming a competent and caring physician.

The Jigsaw Puzzle

Quyen D. Chu

Quyen Chu comes from Tavares, Florida and received his undergraduate degree from Dartmouth College. He is in the 4th year of medical school at Brown and plans to go into surgery.

It was late fall, the second quarter of my 3rd-year clerkship, and I was assigned to the Medical Service. They say that the Medicine clerkship is one of the most important and rewarding experiences for a medical student. For me, it was also the most crucial point, for the experience had taken me to a new height of understanding in the meaning

of becoming a doctor. I was assigned to an AIDS patient who had presented with lower gastrointestinal bleeding and multiple episodes of syncope. I was initially hesitant because I had never before taken care of an AIDS patient. I formally introduced myself to a cachectic-looking 37-year-old homosexual man named Mitch (not his real name). I performed the routine history and physical examination and presented my findings to my resident physician.

"Quyen, did you do a rectal?" he asked. Seeing me pause, he squarely screwed his eyes at me and said, "A rectal exam is extremely important, especially in a patient with syncope. Come on, you should know that. This is not the first syncope patient you had to work-up." I apologized and returned to perform a rectal examination on Mitch.

"Sir, I need to do a rectal exam on you," I explained to Mitch.

"Oh man, do you really have to? I really hate rectals," he responded. I smiled to myself, remembering very well the countless times I had heard patients saying this.

"Sir, if it's any consolation, I have not yet hurt one patient doing this," I reassured him. I did not realize then that this was the first of the many consolations I had to give him.

As the days passed the many new tests performed on Mitch were non-diagnostic. No one knew what he had (besides AIDS), and Mitch became well known to the medicine ward. Being curious and liking a challenge, I attempted to find out what Mitch had. I became engrossed in the uniqueness of the disease, not fully comprehending the implication it might have on Mitch until the day he had a grand mal seizure and was post-ictal for 30 hours. I was stunned and felt a sense of unexplained guilt. I asked myself whether the seizure could have been avoided had I been more thorough with my assessment and plan. My mind raced back to my childhood days. I recalled a caring Iranian family doctor who was upset with my mother for not keeping her appointment. Embarrassed, my mother admitted to him that her reason was financial. He immediately became compassionate and said, "If you don't have the money, that's not a problem. Pay me later." From that day on, he had never sent her a bill for her check-ups, but Mother always paid with what she could—\$5 for each visit. I decided from that point on that I wanted more than anything to be a doctor—a doctor to all the Mitches.

As time passed, I came to know Mitch personally. We shared and talked about our significant others. He about his lover who loves to cook and watch movies, me about my Trina who loves her part-time job as a

* Affinity group is a 4-year continuum program that offers to PLME students a chance to pursue interests that may not be addressed in tradition pre-medical and medical courses. Beginning in the junior year of undergraduate studies, affinity groups also serve to ease the transition from pre-medical years to the first 2 years of medical education. Each affinity group consists of one to two preceptors and 6 to 12 students who have a common interest that they wish to explore. The theme of my affinity group is geriatrics.

disk jockey for a Boston radio station. I discovered that although we may be different, we were similar in many ways—our hopes and aspirations for the best, our frustrations and joys with our significant others, and our complaints of everyday nuisances.

One day, Mitch thoughtfully confided in me, "You know I thought I was only going to be here for a week. Now it's been a month. I don't think I can make it to Thanksgiving this year. I saved enough money to finally visit my parents, but I don't think that I'm going to get out of here. They just want to keep me here forever. You know what I really miss most—my cat." Until then, it never dawned on me that Mitch had but one visitor since the day he was admitted to the hospital. That evening, I went home and bought him a gift that I thought would keep him occupied to pass the day—a jigsaw puzzle. On Thanksgiving day, after returning from a dinner with a fellow medical student, I returned to visit Mitch and gave him his present. He smiled and shook my hands.

Several days passed, I noticed that Mitch hadn't opened his jigsaw puzzle. "Mitch, when are you going to try the puzzle?" "When I'm strong enough," he would reply, laughing.

One day, Mitch grabbed my hand and cried, "Doctor, please help me to accept my fate." I felt startled. I thought to myself, "What could a 24-year-old medical student possibly say to a dying 37-year-old man to alleviate his anguish?" I only grabbed his hands with mine and squeezed them for some time.

With each passing treatment, Mitch would tell me that he was feeling much better. He boasted of finishing half of his supper, and he even tried a little of the apple pie. Before each morning round, I hurriedly logged onto the computer to review his laboratory findings with hopes for signs of improvement, only to be disappointed by the tenacity of his illness. Mitch was getting worse each day. Mitch's kidneys were failing.

"Mitch, how do you feel this morning?" I asked. He barely cracked a smile. I performed my physical examination on his ailing body gently and gave him words of encouragement. "Mitch, how can I make you more comfortable?" I asked.

His trembling hand reached out to grab mine, barely whispering with tears. "Doc, please let me go home. I miss my cat. I'm not afraid to die anymore. I just want to die in my own home, with my cat next to me." I held back my tears and replied, "Mitch, I will see what I can do." As I walked out of the room, I realized that the only way Mitch was ever to leave the hospital was either to

get better or to die in the hospital, and the latter seemed to become more of a reality with each passing day. Each day, more diagnostic tests were performed on his wasted body (in fact, Mitch must have gotten at least 4 CT scans of his head). I remembered a quotation I had seen, written by a Chinese politician, "The whole purpose is to save people, not to cure them to death." My mind wandered back to the old country from which I had emigrated, Vietnam. I remembered my cousin dying of an infection that could easily have been cured in the States. I particularly remembered his serene, smiling face as he was surrounded by family members as they each took turns holding him in their arms, kissing him and telling him what a good boy he had been, and how he is going home to a special place in Buddha's palace.

One morning, I went to visit Mitch. I passed two men who were hauling what looked like an empty laundry cart. Seeing the puzzlement on my face, a nurse stated nonchalantly, "Oh, that's what they use to carry out dead people." Before starting our daily morning rounds, my resident pulled me aside and told me of how Mitch had passed away comfortably the night before. Mitch had a terminal illness and had come to the hospital to die. When I arrived, his bed was empty. The nurses had cleaned it this morning. His name outside the room was gone. Everything about him was gone. I looked around the room to try to find traces of Mitch and the only thing I saw was the unopened jigsaw puzzle. "Mitch, when are you going to try the puzzle?" "When I'm strong enough." I gingerly picked up the puzzle so as not to disturb the ribbon bow that was still left on it, and stared. Somewhere in the distance, I could hear my beeper going off.

Clearing the Fog About the Clinical Years at Brown: A Handbook by Medical Students

Arshad Ahsanuddin, Paul Breidling, John Cribb, Deana Theroux, Charis Meng, Sandy Kazura, MD, David Kroessler, MD

Arshad Ahsanuddin, Paul Breidling, John Cribb, and Deana Theroux are members of the Brown Medical School Class of 1996, Charis Meng is a member of the Class of 1994, and Sandy Kazura, MD, David Kroessler, MD are Affinity Group faculty co-leaders for 2nd year medical students.

A great deal of anxiety and uncertainty surrounds the transition from basic science to clinical medicine. We, as medical students, face much difficulty separating the myths from the reality of what will be expected from us as we move from the books on to the wards. As part of the program here at Brown, each medical student joins a special group composed of a few classmates, a member of the 3rd year class, and faculty facilitators. Each student chooses an "affinity group" based on a common theme that all the students are interested in exploring more in depth, outside the normal curriculum.

Originally, we started out exploring the topic of stress and stress management in medical school. We eventually realized that much of this distress resulted from our lack of knowledge of what lay ahead of us: the

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actual sequence of events involved in our transition into clinical clerkships and residency remained fairly nebulous, even 2 years into medical school. To address this issue, we decided that each of us would research an aspect of the process of selection and enrollment in clerkships here at Brown, and then in the residencies to follow. Eventually, we realized that it might be beneficial to future medical students for this information to be easily available. We decided, therefore, to compile that research into a handbook for future Brown medical students. It would include simplified explanations of core clerkships and the clerkship lottery at Brown, selection of career advisors, the Dean's letter of recommendation, and the dreaded "Match."

The initial handbook was well received by our classmates. We realized that we were not alone in our anxiety regarding the future. Most of our classmates, to varying degrees, were unaware of the nuts and bolts of the transition to clinical education. With that in mind, we decided that our initial research could use elaboration to make it even more useful to future medical students. Therefore, we plan to expand our initial ambitions, putting together a more in-depth examination of the different clerkship options available at Brown. We feel that providing future medical students with more comprehensive information about the clinical curriculum here at Brown could only relieve some of the apprehension of the basic science years and allow them to enter into the hospital setting with open eyes.

Some Thoughts on Medical Education After Our First Year of Medical School

Manish Butte, Marilyn Li, Rebecca Pringle Smith, Jerome Liu

Manish Butte is a 2nd year medical student, involved in research in physics and biomathematics. Marilyn Li is a 2nd year medical student, with significant experience as a teaching assistant in pre-medical and medical school courses. Rebecca Pringle Smith is a 2nd year medical student who works in clinical trials. Jerome Liu is a 2nd year medical student who has done clinical research in diagnostic radiology.

Besides our pre-medical work, two of us have had experiences in scientific research that were significant parts of our intellectual development. One of us worked in pure

science, the other two in clinical research. In our first year of medical school, we have had difficulty in reconciling much of our academic activity with the scientific values we had developed as a result of our research experiences.

Clearly, memorization is and will continue to be an important, if unpopular part of medical education. However, the ability to memorize vast quantities of material does not prepare doctors for many mundane scientific problems that they will encounter in routine patient care. It is necessary to understand the methods for establishing the validity of the scientific facts that we learn in medical school. Instead of memorizing huge quantities of facts, it might be more efficient to learn how to access them quickly and efficiently by becoming computer literate.

We are aware that the perceived inadequacy of medical education is not a "new" problem. Our professors commonly lament that they have not been allotted sufficient time to teach us properly what we need to know about their discipline. However, we wonder what most of them would do with more of our time, were it allotted? Would they just provide more information for us to memorize? How many of them really believe that this would significantly increase our understanding of their discipline?

The skills in brute force memorization that medical students develop are often at the expense of more important deductive skills. In the past, memorizing reams of anecdotal cures and mnemonics for diagnostic signs was critical to being a successful healer. Soon, the databases doctors had to carry in memory will be available on pocket computers, accessible with a few swift keystrokes.

Let us take an example that will illustrate

the importance of the ability to appreciate subtle distinctions in the quality of scientific evidence for doctors who do not engage in research, doctors who only treat patients. If two drug companies provide a physician with two new but slightly different versions of a particular drug, how is that physician prepared, through his or her medical education, to judge whether the evidence provided in the glossy circulars actually establishes the efficacy of either drug? How is the physician supposed to compare the evidence in the two circulars? By memorizing the details of the material in each of them, and doing an elaborate, detailed comparison? One could suggest that the physician consult the literature, perhaps the *New England Journal of Medicine* for the results of clinical trials. Yet where do physicians learn how to evaluate the quantitative underpinnings of trial results? Where do they develop the ability to review research articles critically? There is undoubtedly a gap in the present system.

We have often heard the old saying intoned, "Medicine is an art as well as a science." We understand that there is much more to medicine than the dispassionate application of scientific methods to clinical

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problems. We know that once we are in our clinical years, we will really come to appreciate the "art" of medicine— but when are we going to find the "science" part we are supposed to be appreciating as well? Like most medical students, we can wax poetic about the importance of compassion and the development of a therapeutic relationship with patients. If physicians really care about their patients, then they should be willing to become scientifically literate enough to provide them with the best care available—and medical schools should be working to assist them.

Primary Care

Joanne Wilkinson

Joanne Wilkinson comes from Providence, where she graduated from Lincoln School ('87) and Brown University ('90). She is a 3rd-year medical student and hopes to go into family medicine.

It is 95 degrees, and I am listening for Korotkoff sounds. My shoulders, bare in a tank top I would never wear to the office, have that hot dry "I'm freckling-even-as-we-speak" feel, and sweat trickles down the inside of my arm. I know what they sound like—the little *ppfff* noises that signify the range between systolic and diastolic blood pressures in the brachial artery. I have heard them before. The patient is a large, florid 50ish man so to be safe I've inflated the cuff up to 190, and now it is dropping, dropping past 150, the white needle gracefully falling. The lower it gets, the more anxious I am about not hearing the Korotkoff sounds.

It's not that I don't know how to do this. I have taken a million blood pressures in the clinic where I am working this summer as a federally funded student, told patients a million times over "110 over 70" or "130 over 85." It's not my competence I question. I am standing at the moment in the middle of the town green, which has been overtaken today by the local Blueberry Festival. We are screening blood pressures for free and instead of the familiar hushed backdrop against which I usually listen, I hear the high-pitched hum of little kids pleading for cotton candy, the intermittent hawk of the Kiwanis Club members selling their blueberry muffins and blueberries 'n' cream, and the distant oom-pa-pa of the high school band.

As the needle drops past 140, I begin to make contingency plans. If I don't hear it I will simply explain that the band was distracting me, I'll take the cuff off and crush it in my hands to deflate it completely then refasten it really snugly and crouch down next to him, clamping the stethoscope to my

ears and try again, tricks to make you hear better. The problem isn't hearing the sounds, though—it's distinguishing them from the happy mayhem around me.

I look intently at the dial and realize that with my hunched-over posture we have created a little world here—me, the patient, his arm, the arm of the lawn chair he sits in. The festival swirls around us as we sit in suspended animation. Blueberries are sold, families argue, teenagers rebel, puppy dogs break free from their leashes and head for the hot dog stand. It requires all my concentration to listen for these tiny sounds over the booming high school drum. The posture feels familiar, and I wonder for a moment how many times in the past year of medical school, and how many countless times in the future, I will sit like this again hunched over some patient trying to block out the

noise while listening, listening.

The needle sweeps past 120 and then I hear it, faint at first, but the second time an unmistakable *ppfff, ppfff* that is going at a nice, slow rate, I smile as I make his blood pressure to be 118 over 75, lower than I would have thought from looking at him, but a nice surprise all the same. His eyes have been trained on my face all along and now he smiles, too, probably having noticed my worried look and wondering if it meant something was wrong. Now, he thinks, he is probably okay.

I pull the stethoscope off my ears and crouch down to pull the cuff off his arm and give my aching legs a rest. Behind me, the band goes into a loud rendition of something barely recognizable and we both laugh at the sudden din as I lean in to tell him the good news.



'Ron's Rule'—I give myself one week to meet new people and start having fun on a locum tenens assignment. It hasn't failed me yet."

Ron Richmond, MD, joined the CompHealth locum tenens medical staff when he completed his residency. He wanted to travel. He loves to meet people. A little time off sounded

really good. And he thinks being exposed to different types of medical practice will serve him well when he returns to his hometown to establish a community health center.

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Factors Influencing the Utilization Practices of a Pediatric Emergency Room

Ann Abraham, Mark Acker, Foong-Yi Lin, Khanh Nguyen, Gregson Pigott

Visits to US hospital emergency rooms (ER) have risen dramatically since 1955. Between 1955 and 1970, ER visits increased 312%, while outpatient visits increased only 50%.¹ At least 65% of these visits are estimated to be made for non-urgent reasons, with visits that were classified as "serious, but not urgent," or "not serious."¹ The non-urgent use of the ER seems to be most apparent in urban areas, where many blame this phenomenon on the US health care system's inability to deliver accessible and affordable health care to those in need. Those who use the ER for non-urgent or inappropriate concerns tend to be those who are without a regular source of care—namely the indigent, the uninsured, and members of ethnic and racial minority groups.

The purpose of this study is to examine the use of an ER in an urban setting—the pediatric ER at Rhode Island Hospital—and to analyze any significant trends in usage. Of interest is whether there is a difference in appropriate ER use among those who have Medicaid vs private insurance, those who are white vs those who are black or Hispanic, or those who have a regular source of care vs no regular source of care.

Materials and Methods

To assess the utilization of Rhode Island Hospital's pediatric emergency room an 8-question survey was developed by five Brown University 3rd-year medical students. The survey addressed the demographics, emergency status, insurance status, and the appropriate alternative medical facilities available for a sample of patients. The use of the emergency room as a primary care facility was also investigated. The survey used was one obtained and revised from a similar questionnaire designed by Jacob et al.²

Ann Abraham, Mark Acker, and Gregson Pigott all received their undergraduate degrees from Brown; Foong-Yi Lin is a graduate of Barnard College, and Khanh Nguyen is a graduate of Oregon State University. All are 4th year medical students at Brown.

We interviewed the accompanying adults of a random sample of 120 patients seen from May 24 through May 31, 1993. Patients were between 1-day-old and 18-years-old. Patients were interviewed during the morning, afternoon, and evening hours on both weekdays and weekends. The following types of data were investigated by the survey instrument:

- *Demographic information* (age, sex, and ethnic background).
- *Insurance status*, which included private, Medicaid, and non-coverage
- Information regarding *patient access* to primary health care was obtained. Patients were asked if they had a primary care doctor or clinic where they normally obtained care, and whether these facilities were available to them at the time of their arrival to the emergency room.
- The nature and duration of patients' *chief complaints* and whether their condition had worsened, improved, or stayed the same. If they had a facility or physician who normally provided their health care, patients were asked if their primary health provider was aware of the nature of the problem that brought them to the emergency room.

The students then classified the seriousness of the patient's chief complaints, using a system originally developed by Jacobs et al.,² and assigned patients to one of three categories:

1. **Category A**—an emergency requiring emergency room facilities or on physician referral;
2. **Category B**—an emergency but can be taken care of in an outpatient office; and
3. **Category C**—a non-emergency.

A patient was assigned to category A if they required hospital facilities (eg, X-rays, laboratory tests), arrived by ambulance, required hospital admission, or were referred by their primary physician. Patients were assigned to category B if they presented with an emergency that could be serious (eg, lacerations requiring suturing) but could be worked up in an out-patient setting without requiring hospital facilities. Patients were

Instead of . . . discouraging the use of the emergency room for primary care services, perhaps efforts would be more constructive if they were concentrated on how better to deliver health care needs through the emergency room.

assigned to category C if they presented with minor non-life-threatening complaints. The students met as a group to discuss each case and agreed upon the assignment of all patients to one of the three categories. After some discussion, it became evident that a fourth category needed to be created, namely category A+C, to accommodate those patients who presented to the emergency room with category C minor or non-life-threatening complaints (as subjectively determined by the five medical students) but yet were referred to the emergency room by their primary medical doctor and therefore met criteria for category A. These "A+C" patients were therefore deemed to be "non-appropriate" or "convenient."

Finally, the appropriateness of each patient's emergency room visit was determined by the group of students. A visit was termed "appropriate" only if the patient was assigned to category A. All other patients (in categories B, C, and A+C) were termed "non-appropriate." This determination of "appropriateness" was not meant to be judgmental on by medical students, but rather to categorize patients whether they truly needed the emergency room for their treatment, not if they deserved treatment. All patients were recognized as having the right to proper health care treatment and therefore their contacting the health care system was certainly appropriate. However, in this study, the term "appropriate" visit was reserved for those patients requiring emergency room facilities. Thus, the term "appropriate" should be translated as "appropriate for the emergency room." Chi-square analysis was used to analyze the categorical data for statistically significant differences.

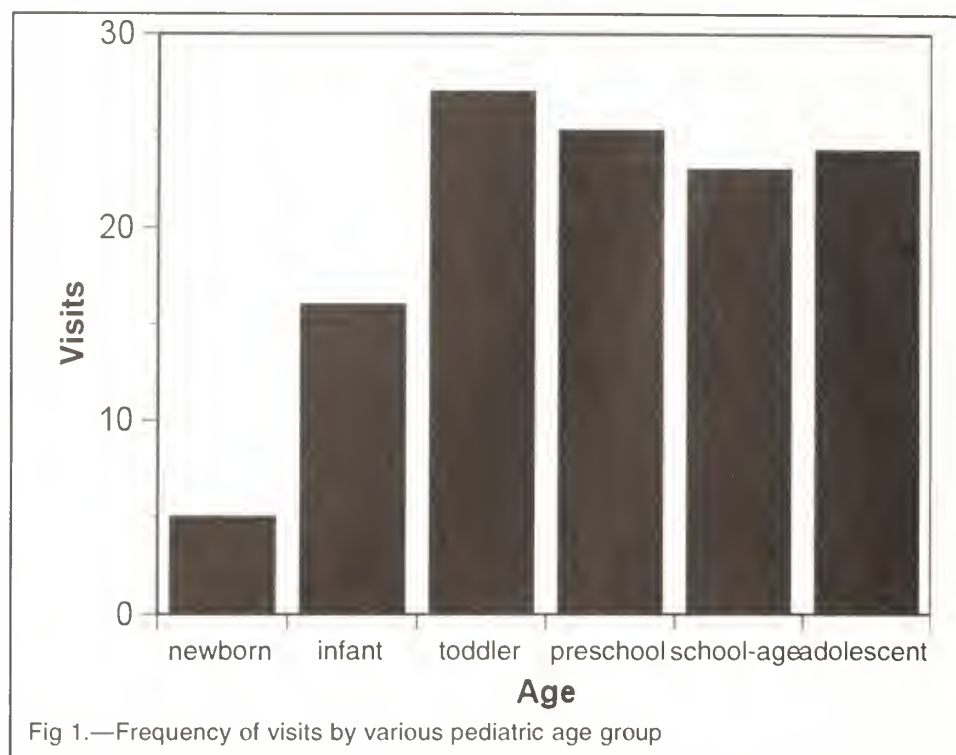
Results

Figure 1 shows the distribution of the 120 patients by age. There were few infant or newborn visits.

Figure 2 illustrates the distribution of the

ABBREVIATIONS USED

ER: Emergency room
FADC: Families and dependent children



complaints. Minor trauma and infection together comprised the majority of the visits. Minor trauma included visits for small lacerations and sprained ankles. The majority of infections were for upper respiratory symptoms, suspected meningitis, and urinary tract infection. Respiratory complaints included asthma, allergy/bronchospasm, and difficulty breathing secondary to smoke inhalation. Gastrointestinal visits were for abdominal pain and nausea and vomiting. Major trauma included visits following injuries involving a motor vehicle either as a passenger, bicyclist, or pedestrian, injury to the head, or complicated injury requiring neurosurgery. Miscellaneous complaints included visits for chest pain, overdose or poisoning, rash, sexual abuse, and tick bite.

The students judged 42% of the ER visits to be appropriate either due to the nature of the complaint, evaluation of the complaint requiring use of the hospital facility, or the complaint was referred by an outside health care provider. However, about half of these "appropriate" visits were for convenience referrals.

Table 1 shows that the number of males and females in the sample was about the same and that females more often presented in the emergency room for less emergent complaints. However, these differences were not statistically significant.

The majority (52%) of the patients were white, with the remainder of the patient sample being about evenly distributed among black and Hispanic ethnic backgrounds. Five of the patients were Asians, and one was Native American. These six

patients were excluded from the chi-square analysis due to the small numbers in the sample. A greater percentage of blacks and Hispanic patients were found to use the emergency room for non-emergent complaints, and this difference was statistically significant ($P < 0.05$).

Most pediatric patients had some form of insurance coverage (94%) with 57% covered by Medicaid. Patients on Medicaid or having no insurance were found to use the emergency room more often for non-emergent complaints than private insurance patients ($P < 0.05$).

The majority (57%) of the patients sam-

pled received primary care through a private primary care provider. The remaining either received care through a clinic service or did not have a regular primary care provider (only 4). Five patients did not have a regular primary care pediatrician and they were not considered in the chi-square comparison. Patients receiving primary care through clinic services were found to have significantly more non-emergent uses of the ER service ($P < 0.10$, $P < 0.05$ for category B only vs C).

For patients with access to primary care, about half of the pediatricians were available either through office hours or non-office hour coverage at the time of the emergency room visit. Patients for whom their pediatrician was not available had significantly higher percentage of non-emergent ER use ($P < 0.10$).

Most patients did not attempt to contact their pediatricians before arriving at the ER (65%). However, of those who did contact their pediatrician, 76% of these visits were appropriate. Conversely, of the patients that did not attempt to contact their pediatrician, almost half (47%) were for non-emergent visits. These differences were highly statistically significant ($P < 0.001$). This is not surprising since, by definition, one of the criteria for appropriate visit was physician referral. However, again it must be emphasized that about half of these were convenient referrals.

Discussion

Our data indicates a 42% appropriateness in the use of the ER. This is consistent with a study done by Jacobs and Gavett, using the same criteria of appropriateness.

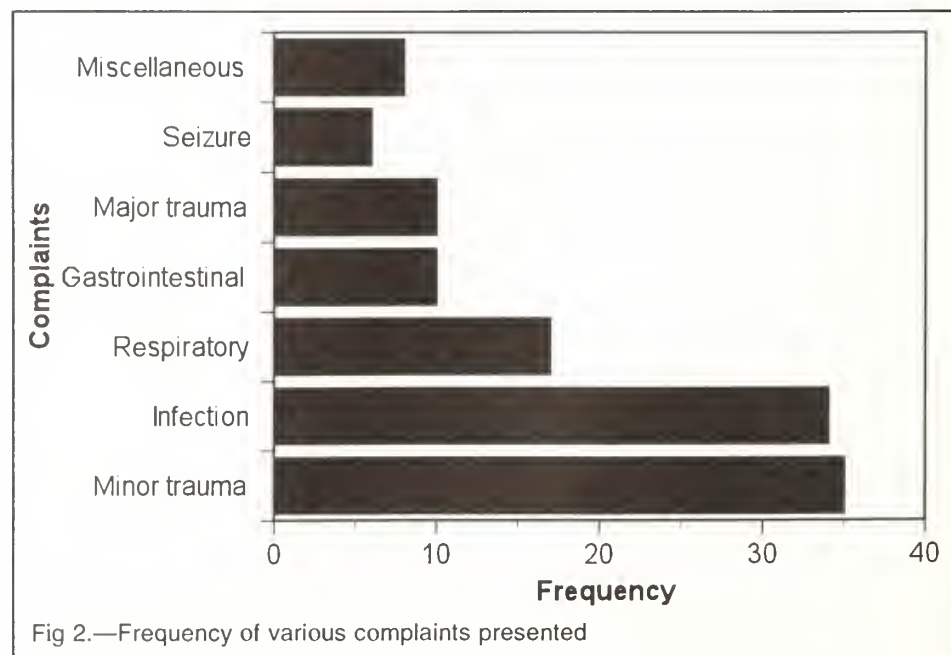


Table 1.—Factors associated with appropriate utilization of the emergency room.

	A (n=50)	B (n=29)	C (n=41)	Total (n=120)	P-value
<i>no. of patients (% of group)</i>					
Gender					
• male	27 (43)	19 (30)	17 (27)	63 (53)	NS
• female	23 (40)	10 (18)	24 (42)	57 (48)	
Race					
• white	26 (44)	21 (36)	12 (20)	59 (52)	$P<0.05^*$
• black	8 (32)	5 (20)	12 (48)	25 (22)	
• Hispanic	14 (47)	3 (10)	13 (43)	30 (26)	
Insurance					
• private	19 (43)	17 (39)	8 (18)	44 (37)	$P<0.05$
• Medicaid	28 (41)	11 (16)	29 (43)	68 (57)	
• none	3 (38)	1 (13)	4 (50)	8 (7)	
Alternative					
• private	29 (43)	21 (31)	18 (26)	68 (57)	$P<0.10^{**}$
• clinic	20 (43)	7 (15)	20 (43)	47 (39)	$P<0.05^{***}$
Available					
• yes	31 (50)	15 (24)	16 (26)	62 (52)	$P<0.10$
• no	19 (33)	14 (24)	25 (43)	58 (48)	
Contact					
• yes	32 (76)	6 (14)	4 (10)	42 (35)	$P<0.001$
• no	18 (23)	23 (29)	37 (47)	78 (65)	

* n=114, figures and comparisons do not include 5 Asians and 1 Native American
 ** n=115, figures and comparisons do not include 5 patients without primary care provider
 *** comparison of category B only vs. category C

However, it is important to note that of the referrals one might not consider some conditions, eg, undiagnosed rash and adenopathy, to be life-threatening, requiring the services of the ER. Under these circumstances, about half of referrals were considered inappropriate. Only 30% of these inappropriate referrals can be explained by lack of availability of the physician, suggesting that the ER serves as a convenient back-up. The remainder of inappropriate referrals need further evaluation other than that provided by this survey. Factors that influence inappropriate utilization of the ER include ethnic background, insurance status, alternative source of primary care, and availability or convenience.

It was noted that Hispanics and blacks use the ER for more inappropriate uses. While the ethnic difference may be explained fully by socioeconomic factors, we have not done a stratified analysis to confirm this.³ Several sociocultural factors may also explain this finding, including Hispanic or black patient's perception of illness. In the face of prejudice and the stress of one-parent families, the perception of illness is altered.¹ Under stress any illness becomes more severe and debilitating and the patient's perception of this would define the visit to the ER as appropriate. Hispanic use of the ER can be further explained by understanding the relationship between illness

and care by a doctor. It is not the severity of the illness that is important, but the interaction between the doctor and the patient itself that symbolizes the healing process.⁴ For Hispanics, there is no distinction between major and minor illness. Therefore any visits to the ER are perceived as appropriate. Other studies have indicated that minorities use the ER as a means of avoiding racial discrimination experienced in a white physician's office or clinic.⁵ It would have been interesting to determine if there was a

disproportionate use of the ER by blacks and Hispanics. Without census data concerning the proportion of these ethnic groups in the surrounding area of Rhode Island Hospital, we cannot determine this.

We also found that Medicaid recipients use health care services more than patients with private insurance. This greater use could be explained by the fact that Medicaid recipients receive full coverage for all medical expenses and therefore have no incentive to use alternative care outside the ER. In contrast, patients with private insurance have disincentives to use the ER. Also, Medicaid patients have more limited access to alternative health care since many private physicians do not accept Medicaid.

Our study indicates that only 4% of pediatric patients receiving care in the ER had no insurance. The majority of patients were covered by Medicaid, reflecting social policies regarding the assurance of access to health care through FADC programs. It is worth noting that this would be very different in the adult population.

Patients receiving primary care through clinic services were found to have significantly more non-emergent uses of the ER. This may reflect the crowded conditions and large number of patients handled by the clinic, long waiting hours, and limited continuity of care as compared to private practices.¹ Patients are more likely to go to their primary care site if they are guaranteed that they will be seen by their primary care provider, a condition that is not suited to the resident staffing of the clinics. The ER is more convenient, since no appointments are necessary.

Lack of availability of a primary care physician has a major influence on the usage of the ER.¹ Our study indicates that 48% of overall visits occurred during off

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hours.⁶ Nearly half (48%) of category B uses of the ER were during off hours, indicating no alternative care at the time of visit. Many people were using the ER for non-emergent conditions because their doctor was not available. This function could be well served by the ER. It would not be cost effective for each individual primary care site to provide 24-hour ambulatory services. The ER represents a fixed cost distributed among its patients.⁶ Patients with non-emergent conditions reduce the cost for those who truly require the ER services.

From our research it appears that there are many factors that influence the ER use. While insurance policies can be altered to deter inappropriate ER use, patients' perceptions of what conditions are considered emergent, the convenience of the ER, and the 24-hour availability of the ER are strong motivators for ER use. Given such strong determinants of ER use, perhaps we, as health care professionals, should redefine appropriate vs inappropriate ER use. The ER represents one branch of ambulatory services. Why should its use be narrowly confined to emergent conditions?

We propose that a two-track system be developed within the ER itself—one to handle emergent conditions, and the other to handle non-emergent conditions. This should improve flow within the ER, so that those truly requiring emergent services would receive immediate attention. Furthermore, by employing a less skilled provider (ie, a physician's assistant or nurse practitioner) to handle the non-emergent cases, the fixed cost of the ER could be reduced. Within this scenario, follow-up can be achieved through the non-emergent track. The argument against the proposal is that continuity of care would be lacking. This could be resolved by giving a copy of the ER records to the patient to give to his or her primary care provider.

We began this study with the belief that the ER was being used inappropriately in the majority of cases. In analysis we have come to realize that our definition of appropriateness may need to be redefined. Future studies will have to investigate the factors that contribute to over-use of the emergency services using multivariate analysis since many of the factors are inter-related. For example, ethnic differences, type of insurance coverage, and having an alternative access to health care are probably inter-related and associated with socioeconomic status, a factor that was not explored in this study. Besides investigating the influence of socioeconomic status, future work will also need to address appropriateness of visit on the time of the day, since this also has an impact on the use of emergency services.

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HOW MANY PHYSICIANS DOES IT TAKE TO PREVENT BLINDNESS FROM GLAUCOMA?

Two.

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to both diagnose and treat the disease
and a primary care physician with a commitment
to educating patients about the need for
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In the Minds of Our Children: An Adolescent's First-person View of Mental Illness

Michael Y. Tso

This essay brings the reader into the mind of a mentally ill adolescent to see the many variables that influence his daily thought and practical life. This essay is not an attempt to tell a complete story but does seek to challenge health professionals to look beyond the *DSM-III-R* diagnoses of major depression and obsessive compulsive personality in this adolescent and to grapple with the difficult task of deciphering the intricate interplay of symptoms and circumstances that surround such patients, to develop a therapeutic plan that respects the uniqueness of the patient and his illness. Names have been changed to ensure confidentiality.

I am John Peter Kang, 18-years-old, born April 3, 1974, in Baltimore, Maryland at 3:52AM, 7 pounds 0 ounces. I have a mother, father, a brother, and a dog, and am a first generation Asian-American. This is my life recently or what I can recall or at least what I want to share with you.

I should introduce you to my family; that seems most appropriate. My parents were both born in Nanjing, Jiangsu Province, People's Republic of China; it was not called this when my parents lived there. They fled to Hong Kong after the Communist revolution in 1949 and emigrated to the United States in 1967. My father is a neurologist and my mother has a college education in English literature but has not worked in many years. I also have a brother who is 3 years older than me. My dog's name is Prince.

I am currently attending a top-notch prep school in Massachusetts and want to succeed. My parents have always raised me with a very strong work ethic and being the best. They have made many financial sacrifices to give me the very best education possible, and it is my duty to make that investment worthwhile and for it to pay dividends in the future. It is very important that I be the best particularly in my academic schooling, because I am small in stature and

Michael Tso comes from Northbrook, Illinois and received his undergraduate degree from Brown University. He is in his 4th year of medical school and plans to go into family medicine. The author changed the names and the events are not exactly as they occurred, some are fictional. At times he intentionally wrote in a stilted manner to better portray the patient's voice.

unable to succeed in the physical arena. Failure is not an option. I am a practicing Roman Catholic although the rest of my family are traditional Buddhists. These are the basic facts, but this does not let you see who I am. Therefore, I would like to bring you alongside me through a 24 hour cycle so that you will better understand me.

I call this exercise "A Day in the Life of John Peter."

3:00AM—I wake up after 4 hours of sleep and do calisthenics to get my blood going and immediately begin work on the English essay I had not finished yesterday, but I run into a roadblock in my desire to finish my essay. I must make a list of the goals that I wish to accomplish today, tomorrow and the rest of the week. That takes me nearly an hour.

4:00AM—The house is still quiet, almost unnervingly so, but I have to urinate and defecate. I enter the bathroom and proceed to clean the toilet and the wash basin four times to ensure complete disinfection and after completing my bodily functions I clean everything once again for the sake of the health of my family. Cleaning is an unending chore that helps me feel safe in my environment, but it takes so much time, too much time, but I need to.

5:00AM—I sit down to finish my essay. Yesterday, I was only able to finish two of five paragraphs of my essay, and over the next 2 hours I am only able to finish one more paragraph to my satisfaction. It infuriates me that I am unable to complete the assignment, but it is time to eat some breakfast, so that I have energy for school.

7:00AM—I greet my mother and father in the morning. My father is a very busy man and is already preparing to leave to go to his enormously successful private practice. I am not hungry, but I must have calories in order to have sufficient energy to make it through the day. My father leaves, exhorting me to work hard at school, and as I leave my mother tells me to be careful walking to the bus stop.

8:00AM—I arrive at school, and, lately, school has been a disaster. I must face the humiliation of turning in incomplete assignments and getting less than optimal grades. I have few friends, for teenagers are my enemies. I shun them, and they shun me. Adults like my teachers are worthy of conversation, and they have a lot of knowledge that I can gain. I spend most of my school day thinking up and listing the many things that I need to accomplish academically after school.

Simultaneously, I berate myself for not

Please pray for me because the path of my life is uncertain.

reaching my academic potential. My work is simply inadequate, in the fact that I am unable to accomplish it. It is lonely at school, but I have no alternative. I must concentrate on working and gaining knowledge so that I will succeed. Teenagers in this society indulge in frivolous activities to which I need not pay attention. I am better than them, and my labor will bear fruit.

3:00PM—I anxiously return home to begin my assignments that are due tomorrow. I am fatigued—25 push-ups help me to focus once again. I begin some reading for my history class and in order to truly incorporate the knowledge before me I must know every word written in the book. After three pages of memorization I tire and begin to make a list of things that need to be accomplished by the evening's close.

5:00PM—I return to my reading and attempt to finish the chapter. I fear that I have forgotten what I had committed to memory previously, but I know I must move on. Exasperated after reading 10 pages, I turn my attention to the order or lack of order in my room. I check the locks on the windows and door, and everything must be in its proper position perfectly aligned and placed before I can return to my reading. I finish three more pages and the chapter by dinner.

7:30PM—My father has returned home and my mother has prepared a delicious-looking dinner, but I have little appetite. I attempt to eat as much as I am able. My brother is not present; he is away at a prestigious university. Our conversation revolves around my father's practice, the miserable shape of the economy, and, in recent memory, an oratory from my father about how lazy people are in the United States, always wanting something for nothing. I wholeheartedly agree with him and then asked to be excused so that I may return to my homework. Before leaving my father encourages me to concentrate and be disciplined, but often he ends up criticizing a deficiency such as a recent subpar report card and how my brother never had this problem and how I must concentrate harder and be more disciplined. I take his words as a young man ought to, quietly and respectfully, and return to my room to begin my routine of fatigue and concentration with other assignments. I rarely complete any one assignment and fall asleep at approximately 11:07PM almost every night to arise once again in 4 hours.

It is difficult to relay my routine, because in some ways I know it is abnormal, and at times I lapse into periods of complete despair with no one to talk or turn to. I can no

longer suffer the humiliation of poor academic performance as well as disappoint my father and mother, yet I am also unable to improve and become more efficient. This gives you a visual, physical picture of my activities, but by introducing you to my "friend," you will achieve a greater understanding of the thoughts and emotions that drive my behavior.

My friend's name is Ridelton, and he is actually a fictional character in a series of books that I read a couple of years ago. In these books, Ridelton was a runtish, ugly orphan who was constantly abused and ridiculed by peers and the people of his town, but he had a gift of stealth and grew into a powerful assassin and thief. By the age of 26, he became the Straight Man of the Guild of Thieves, the highest position within the guild, and dominated and regulated the activities of thieves and assassins in an entire region. He gained his skills of thievery and murder through strict discipline and asceticism driven by the dream of paying back his childhood tormentors many times over.

Ridelton is the voice of authority that I hear within in my mind. This voice has been there for a long time, but when I read these books I quickly identified the voice within with Ridelton. Ridelton is a close friend who has provided me consistent companionship through many times of loneliness, but he is also extremely demanding and sets the standard that I must achieve. When I fail to meet the standard, I deserve punishment, and as a result I have done things such as throwing myself down a flight of stairs. Ridelton has also taught me rituals that will discipline my body and mind so that I can concentrate and succeed. On one hand, Ridelton has been a loyal companion, but on the other hand he can be a tormentor, because there are times that I have no more energy to perform the rituals and meet the standards of academic achievement that have been set. Often thoughts of escape have entered my mind, and the only way out is die.

One may ask, why don't you kill Ridelton? I am unable for two reasons. First, I am not even worthy of being Ridelton's pupil, and how can I kill the master, that would be wrong. The other reason is that he has been loyal to me and . . . a part of my life for so long how could I remove him from my being. I think . . . it would be better that I die than to kill Ridelton.

Because of a feeble attempt to commit suicide, I was admitted to a children's psychiatric hospital despite resistance from my parents. Much of what I have shared with you has come from insight into my illness, that I have gained since my admission. I am currently taking Navane and Clomipramine to help with my rituals and depression, and I have come to understand a lot about what drives me and how my past, present, and future interconnect through various counseling sessions. In the past few days, Ridelton, my voice of authority, has spoken less and fearfully I seek to return to the assurance

that he provides. Yet, a new spark within has begun to show me that perhaps the standards are inappropriate, that my success does not hinge solely on academic performance, and that pleasing my parents will not necessarily benefit them or me. These are hard questions that I am afraid to answer, and it is deeply

frightening to consider accepting responsibility for my past behavior and the pain that I have caused many people. Please pray for me, because the path of my life is uncertain as to whether I will follow the script of Ridelton, my father, or my own? or are they all one and the same...?

Martyr

Wrinkled pink skin folded
around the knockwurst sized body. I clenched
my teeth and ignored the black nausea rising
in my stomach. I lifted the corpse
out of its shroud of plastic bag. Pork abortions,
joked my friend, as he placed, with shaking hands,
his pig in the scarred and pitted pan. I laid
my pig out on its back, forelegs stretched wide,
hindlegs pinned together in the black wax. My blade
rubbed against the waterlogged skin of its stomach,
gingerly against the six red nipples.

I didn't want to touch
the lump of dead flesh. I had seen
the science programs where they made
a dead frog flex by shocking it. What if
the pig jumped up when I snipped
into its chest and attacked me? I'm scared
of animals usually: dogs, cats, rabbits
and so on. The thought of my pig
coming back to life terrified me.

Others in the class had already
opened their pigs, so I
braced myself and cut. Black liquid oozed
through the incision, blood filled
with cells that had died long ago. Cutting and peeling,
cutting and peeling, layers of flesh came off
like the skin of an onion, until I saw
the little pieces of silly putty
and the tangled strands of lo mein. The putrid odor
of preservative entered my nostrils
and made my eyes water.

With every cut, I expected a muscle twitch
or a painful grunt. The cold, refrigerated flesh
couldn't make me realize that it was dead. Only
when I cut off the eyelids
to examine the eyes, and I saw
the masses of grey-blue, no more lifelike
than balls of chewed gum, was I sure
that I was safe,
as was the pig.

Garey Noritz

(Garey Noritz, a resident of Stamford, Connecticut, is a junior in the Brown PLME. He volunteers at Steere House nursing home, writes for the College Hill Independent, and is having a ball.)

Combating a Cultural Myth: *la caída de la mollera*

Rex Ruiz

To diagnose an illness properly, a physician needs an adequate medical history from the patient as well as the appropriate physical findings and laboratory results. But, upon telling the patient what illness he or she had, what if the physician asked whether the patient understood what was causing their disease. The physician might be surprised when the patient reveals a unique cultural and physical understanding of the illness, differing substantially from scientifically accepted concepts of etiology. In one case of a doctor asking a Mexican mother about why her child might have diarrhea, she could respond unexpectedly with *el empacho* or *la caída de la mollera*, which are two folk beliefs about the causes of diarrhea.

To understand the knowledge, attitudes and beliefs of first and second generation Mexican mothers concerning diarrheal disease, the Brown University School of Medicine Affinity Group on International and Community Health studied the Cameron Park* community of Brownsville, Texas, during June 1993. The group consisted of six Brown medical students, one Brown college graduate, Dr Lois Monteiro, Dr Robert Northrup and Mrs Quincy Northrup. The group recognized that by learning what these mothers thought about the causes of diarrhea and its treatment, they would be able to design more effective educational

*Cameron Park is a *colonia*, an unincorporated subdivision of Brownsville, Texas. Like many of these *colonias* that exist on the US-Mexico border, Cameron Park lacks basic services, including sewer drains and paved roads. Diarrhea is second only to respiratory infections as the most common illness for which the mothers of this community bring their infants to see the doctor.¹

Rex Ruiz is a 2nd year medical student at Brown University School of Medicine and is interested in a career in primary medicine. Support for the Brown University Affinity Group on International and Community Health was provided for by the Office of the Vice Chancellor and the Affinity Group Program at Brown University, the Upjohn company and the Area Health Education Center of South Texas.

materials about diarrhea, particularly about how to prevent the dehydration that can result from the loss of fluids and electrolytes during the diarrheal episode by using oral rehydration.

The group used two social science techniques to gain this information from the mothers: a survey and a focused group discussion. The first, more standard approach consisted of a five-page survey for which the community health aide, Gloria Moreno, selected mothers who had at least one child under the age of 5 to be interviewed. The students also believed it necessary to offer the women education about the prevention of diarrhea and dehydration in exchange for their valuable time. Therefore, after the interviewers had identified the gaps in the mothers' knowledge from the survey, they offered these women the current recommendations concerning the cause of diarrhea and its treatment. Secondly, a focused group discussion was used as an alternate information-gathering device to generate informal discussion between two of the students who served as facilitators and a group of mothers. Using a focused outline, the students asked questions about what the mothers believed to be the cause of diarrhea, and the mothers responded in a manner that demonstrated their feelings, attitudes and beliefs. Also, during the focused group discussion, the facilitators presented to them the most current WHO recommendations about the prevention of diarrhea and dehydration.

During the first of these focused group discussions on diarrhea, the student facilitators, Carmen Espitia and Rex Ruiz, learned more about traditional Mexican beliefs that relate to the causes of diarrhea: *el empacho* and *la caída de la mollera* (the fallen fontanel). They discovered that *el empacho* is the belief that bad food adheres to the baby's stomach, causing the child to pass loose stools at a more frequent rate. One of the mothers at the focused group discussion explained the phenomenon of *la caída de la mollera*:

"The fallen fontanel doesn't mean that the baby fell or was hit. . . . If you hold the baby back too long, then the fontanel will fall. Other kids will play with the baby [and

The physician might be surprised when the patient reveals an entirely unique cultural and physical understanding of his disease, differing substantially from scientifically accepted concepts of etiology.

bounce the baby], and the fontanel will fall. . . . Soon afterwards, you have the diarrhea; it's greenish and watery."

Although the mothers knew that doctors believe that diarrhea is caused by an intestinal infection that can be contracted when someone drinks contaminated water, they also subscribe to the traditional Mexican beliefs that *la caída de la mollera* and *el empacho* are other causes of the passage of frequent, loose stools. These beliefs have continued to be passed down from mother to daughter or mother-in-law to daughter-in-law today. Only 2 out of the 47 women interviewed voluntarily mentioned *la caída de la mollera* as a cause of diarrhea; whereas, 20 out of 22 women present at the focused group discussion indicated that they believed that *la caída de la mollera* caused diarrhea. It is possible that the women in the focused group discussion felt more comfortable in each others' presence to voice their traditional beliefs, but when approached alone by medical students were reluctant to mention them because of previous scorn of their beliefs by doctors. Even in Mexico, if mothers were to explain to their doctors that their children had *el empacho*, frequently those women would be laughed at or scolded.²

Despite physician insensitivity to folk beliefs, however, many traditional practices persisted because they have been effective for many generations. The affinity group found many of the Mexican home remedies, such as *agua de arroz* (rice water) and *manzanilla* (chamomile tea), consistent with medical treatment for diarrhea. They are effective because the more liquids that the mothers give to their children during diarrhea, the less chance of dehydration. In one study, rice water, because of its high protein and carbohydrate content, was shown to be superior even to the standard WHO glucose electrolyte solution in the treatment of acute diarrhea in infants under 6 months of age.³

However, sometimes the practice of traditional therapies can do more harm than good. Through conversations with different Mexican mothers, the group discovered that

ABBREVIATIONS USED
WHO: World Health Organization

the cure for removing the adherent food from *el empacho* is to perform an abdominal massage (*una sobada*), accompanied by turning the child on its stomach and pulling its back until it cracks. While the practice of back cracking may not cause serious injury to the child, other methods for treating *el empacho* are dangerous. In a recent study, it has been shown that 35% of the population in Guadalajara, Mexico used lead-based remedies to treat *el empacho*.²

Another potentially dangerous practice is used to alleviate *la caída de la mollera*. Through one of the mothers present at the focused group discussion, the students learned that there were four popular methods to raise the fallen fontanel: 1) to push up on the baby's palate with the thumb; 2) to rub the fallen fontanel with a wet towel and to pull up on the baby's hair; 3) to have the child absorb water through the mouth; and 4) to take the child by his or her feet, turn him or her upside down and shake while smacking the child's feet. Therefore, it is easy to see how the last method for treatment of *la caída de la mollera* can lead to the hallmark features of the shaken baby syndrome: retinal hemorrhages and intracranial injury.⁴

Because the two students leading the focused group discussions were outsiders to the community and were part of the medical establishment that neither subscribed to *el empacho* nor to *la caída de la mollera*, and since they could have been discredited for not being experienced in child rearing as the mothers who were present, they were not the appropriate voice to effectively combat these folk beliefs. Gloria Moreno, who was both a community health aide and community leader, was present at the focused group sessions and interjected with the following testimony to illustrate what the mothers should do when they observe the fallen fontanel in their infant:

"I'm going to tell you something. It's what a doctor told me when I had my first-born. People wanted me to believe about *la caída de la mollera*. But, when one has a first child, one doesn't know. My baby got very sick with diarrhea and the fontanel fell. So then, a woman told me that she was going to fix it, but she told me all that she was going to do with the baby. And then I got scared.

I went to the doctor and told him about *la mollera caída*. He told me that *la caída de la mollera* was a custom—a myth. And, sometimes when people don't know something, . . . [that's when a myth is created.] A fallen fontanel really means that a child is almost dehydrated. I proved it to myself. [The doc-

tor told me,] 'You give *suero* (oral rehydration solution) every 15 minutes with a teaspoon every night and day for 2 days. It's a lot of work, but you're going to see that after 2 days the fontanel will no longer be sunken in.' And that's when I proved it to myself . . .

So when the baby loses too much liquid, the fontanel falls. So when the baby regains all its liquids, it rises again. *La caída de la mollera* is a myth."

Perhaps after that particular focused group discussion, not all the mothers were totally convinced that they should reinterpret the meaning of *la caída de la mollera*, but Señora Moreno probably was able to make the women think twice before they allowed their child to be turned upside-down and shaken, and she now has given them a more accurate way of interpreting a fallen fontanel as a sign of dehydration.

To further address this issue, the Affinity Group on International and Community Health designed a pamphlet and highlighted *la caída de la mollera* as a sign of dehydration. It is hoped that by understanding the phenomenon in a more scientific way, the mothers will administer oral rehydration solution to any of their children who become ill with diarrhea. Currently, the pamphlet has been distributed in four counties on the Texas-Mexico border: Cameron, Maverick, Kinney and Val Verde.

By understanding both what a traditional folk belief, such as *la caída de la mollera*, means and what its possible consequences are we can have a measurable impact on health education. It would benefit physicians and other health educators first to assess the patient's knowledge of what is happening during the disease and his or her beliefs about its cause, so that educators can discover a way to combat a culture myth if one may arise. But, when addressing specific population groups, it is an extreme challenge to do so in a culturally sensitive manner. As the affinity group discovered, one effective strategy is to have a well-respected member of that community share a personal testimony relating the traditional beliefs to current medical knowledge. A challenge to traditional belief from within the community can spark discussion, which can allow for a re-evaluation of old ideas and an acquisition of new knowledge.

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Naked

The lady has got four lovers
each one loves more deeply than the last.

Is it possible to own her, to possess, to know her?

She is not elusive.

Along the street I go with twitching skirts
and ankles sneaking under cover.
Rounds of flesh jaunty
a look back with the head
you wonder if I might be warm to touch.
A grin and then I slip behind a door
to change into something more appropriate
for a room for the dead.

The lady who has four lovers
promises to reveal everything.
A look, suggesting
"I know all,
Come find it, come
figure me out.
I will hide nothing from you."
The lovers are eager, their lips glisten.

I could learn from that lady.
Your hand on my back
my scapula the nape of my neck

She will be uncovered and uncovered
Corned beef and cobweb and bone

You and I are nothing but warm surfaces
daring each other, laughing at each other.

That lady, she is
utterly obliging.
Yet never, as I approach her with quivering instrument
have I heard her laugh.

Meg van Achterberg

(Meg van Achterberg is a first-year medical student at Brown. She plans to be a writer as well as a doctor.)

Adapting the Clinical Encounter For the Deaf Patient

Joshua Rotenberg

Deaf people daily must negotiate the communication barriers between themselves and the hearing world. Even though most deaf persons develop some skills for interacting with hearing people, the failure of these communication systems in a medical setting may create serious misunderstandings.

"A patient entering the hospital for surgery, upon admission, answered the medical history questions. The next day in pre-op the patient was asked by the anesthesiologist, double checking, if he had any allergies. The question was signed more clearly [by an interpreter this time]. This time the patient said, 'Yes, almost die,' and spelled the name of the medication. The anesthesiologist was grateful for the interpreter because he had intended to use that very medication."¹

Medical professionals now recognize that cross-cultural conflicts arising in any clinical setting may impede the delivery of quality medical care. While awareness of many cultures has been raised, few are yet sensitive to the issues that arise during encounters with deaf people.

The recommendations in this article are based upon a review of the literature on improving medical care for the deaf and upon my personal experiences while working for the deaf at the Whitman-Walker Clinic and at St Elizabeth's Hospital, Washington, DC.

On Communication

Visits to the physician are anxiety-provoking as well as frustrating for many deaf persons. Not only is it difficult to express their medical complaints and needs, but they also find that the medical system is unaccommodating to their limitations.

Joshua Rotenberg is a 3rd year student at the Brown University School of Medicine. In 1993, he was a recipient of a fellowship from the Swearer Center for Public Service at Brown. This grant allowed him to study at Gallaudet University and to work in medical services for the deaf at the Whitman-Walker Clinic and St Elizabeth's Hospital in Washington, DC.

To bridge this communications gap, many medical professionals will rely upon lip-reading or the exchange of written notes when interacting with a deaf patient. The clinician should be dissuaded from using this method since generally only 3 out of 10 words can be understood by lip-reading. Furthermore, it is known that a key skill for successful lip-reading is knowledge of the *sounds* of words. A British survey has found that deaf people with excellent lip-reading skills were no more able to understand mouthed samples of speech than a random sample of hearing people.

The exchange of written notes is just as poor a method of communication as lip-reading. First, while some deaf are literate, most have very poor reading skills. Estimated literacy rates among the deaf range from 12% to 30%.^{2,3} Second, studies of the deaf show a deficit in medical knowledge. In one study, only 59% were able to interpret a prescription properly. Third, many deaf will reflexively nod during intense encounters with hearing people when, in fact, they fail to understand. In contrast, shaking the head "no," in deaf culture, can mean that the individual does not understand; yet a hearing person will only comprehend this as a negative answer to their question.

A certified interpreter is essential for full communication and confidentiality. Only a certified interpreter is suitably versed in American Sign Language (ASL) as well as local slang, trained in interpreting medical terminology and bound by a code of professional ethics. Among other issues, this code forbids the violation of confidentiality or any editing of the conversation. Asking a friend, parent or spouse to interpret creates an uncomfortable dynamic for collecting sensitive information and violates the confidentiality between the patient and physician. Additionally, due to the Americans with Disabilities Act of 1991, negligence in guaranteeing good communication has resulted in successful legal action.

Finally, even though an interpreter is present, the interaction is still between doctor and patient. The deaf person will want to be looked at, and the interpreter should remain outside of this interaction. Ideally, the interpreter should stand behind the physi-

Currently, there are about 30 million Americans with some form of hearing impairment.

sician so that the patient may see both the speaker's lips and the interpreter's hand signs. There should never be a need for such questions as, "Ask her where the pain is."

Deaf Culture and Important Psychosocial Issues

The interaction between a hearing physician and a deaf patient can be a cross-cultural encounter. Deaf persons have long felt that they shared group characteristics that differentiated them from the others.

Besides a unifying language, an awareness of a group history, and shared norms and institutions, there are criteria that determine who belongs to the deaf culture—and who is excluded. Currently, about 30 million Americans have a hearing impairment, but an audiological deficit is neither sufficient nor necessary to belong to this group. Those who communicate primarily with ASL and who identify with deaf culture's goals, attitudes and behavioral norms are described as "deaf." This group includes not only those who have grown up in silence but also some deafened while adults. Also included are the deaf-blind and even the families of deaf people. On the other hand, a profoundly deaf person who communicates primarily in oral English may not identify with deaf culture.

Deaf history is marked by conflict between ASL proponents and those who favor oral English. Many schools today use English-based "total communication" where mouthing is combined with ASL signs. Few schools now advocate either ASL or oral communication exclusively.

ASL is central to deaf culture, and its users are fiercely proud of their communicating facility, describing it as their natural language. ASL combines signs, facial expressions, body position, finger-spelling and mime in a complex and subtle grammar that is radically unlike English. ASL has no commonly used written form; deaf folklore, humor, poetry, history and drama, accordingly, are embodied in an oral tradition that is told and retold at gatherings.

ABBREVIATIONS USED
ASL: American Sign Language

Table 1.—Suggestions for Better Care for Your Deaf Patient

WHAT IS UNIQUE ABOUT DEAF PATIENTS?

1. Most people who grow up with deafness share experiences, a language and a culture that is distinct from the hearing world.
2. Deaf people live in a visual world, and are likely to miss important auditory information in the medical setting.
3. Studies show that deaf people have less knowledge about health-related issues than hearing people.

ABOUT DEAF CULTURE

1. Most people who grow up deaf refer to themselves as deaf or hard of hearing (HH). For many deaf and HH people, the term hearing-impaired is insulting because it focuses on hearing loss and makes hearing the norm.
2. 90% of deaf people are born into hearing families, but most families never learn sign language and have little verbal interaction with their children.
3. Most deaf children attend local or residential schools for the deaf, but many are now "main-streamed" into public schools. In these schools, deaf people learn the language, history and culture of the deaf community.
4. American Sign Language (ASL) is the language that binds most deaf people. It has a grammar, syntax and slang that is distinct from English. Some deaf people do not use a sign language, but rely on oral communication. Deaf culture encompasses the beliefs, social norms, artistic expressions, history, institutions and political consciousness of the deaf community.

PRACTICAL TIPS FOR TREATING DEAF PATIENTS

The Clinical Interview

1. Dimmed lighting hinders communication and can irritate deaf people's eyes. Also, close the shades on bright windows—"backlighting" can be problematic.
2. Maintain eye-contact as much as possible—within deaf culture, breaking eye contact can indicate the desire to terminate a conversation or disinterest.
3. In deaf culture, it is appropriate to explain why you're leaving a room. An unexplained absence can provoke anxiety.
4. Deaf culture stresses physical contact.—A reassuring pat and a warm greeting will help strengthen clinical partnership. Do not be intimidated by a warm hug. Ask questions about "culture-specific" issues:
 - 1) Did the patient attend a residential school? A deaf college?
 - 2) Was the patient the only deaf person in the family?
 - 3) Is the patient involved in deaf culture?

Physical Exam

1. Explain a maneuver before you attempt it, especially when you will be outside of the patient's visual field (eg, auscultation of the lung fields).
2. Injuries to the hands and eyes may be very upsetting to a person who communicates in sign language.
3. Any procedure or treatment that limits upper extremity movement or visibility is bound to heighten anxiety (eg, dilated fundoscopic exam, physical restraint). Remember that you are limiting the only avenue of communication of pain or distress.

WHERE TO LEARN MORE ABOUT DEAFNESS

Local and State Agencies:

1. Local schools for the deaf
2. Your local association or club of the deaf.
3. Your state commission for the deaf

National Agencies:

1. National Information Center on Deafness, Washington, DC
202-651-5051 (Voice) 202-651-5052 (TTY)
2. National Association of the Deaf, Silver Spring, MD
301-587-1788/6282 (Voice)

SOME IDEAS FOR MAKING YOUR CLINIC MORE ACCESSIBLE TO DEAF PATIENTS

1. Establish a protocol for deaf patients which includes a list of names and numbers of available registered interpreters.
2. Install a TTY (a telephone with a keyboard adapter) in your office and a "closed-caption" decoder on your waiting-room TV.
3. Install a flashing light apparatus (like a doorbell) inside examination rooms to announce your entry.
4. Keep many diagrams, models and visual aids handy for explanations.
5. Learn about the experiences of deaf people, ASL and deaf culture.

SIGN LANGUAGE INTERPRETERS AND YOU

1. Interpreters are critical for clear clinical communication. Some deaf people read lips, but many do not. In any case, only 30% of English words are comprehensible by lip-reading alone.
2. Deafness itself is not a barrier to educational achievement; however, most deaf people are not fluent in English, and some have only basic literacy. While tempting, written communication may be misleading and basing therapy on such interactions is dangerous.
3. Use a registered professional interpreter for every clinical encounter. Asking a spouse, parent, child, lover or friend to interpret violates the confidentiality of the patient and produces an unreliable translation. A registered interpreter is trained to convey the subtleties of ASL and abide by professional codes of ethics that ensure unbiased translations and confidentiality.
4. Always address the patient not the interpreter, and speak at a normal rate. A two-way conversation is easier to interpret and more polite.
5. Interpreters translate everything you and the patient say. Just as you would with a hearing patient, do not say anything that you do not wish the patient to know.

The Silent World

When interacting with a deaf patient, the hearing physician should become sensitive to what the patient may—or may not—see. Are there objects between you and the patient impeding full view? Is the light bright

enough? Are you "back-lit," by standing with a bright light behind you thus creating a silhouette? Do you make eye contact whenever possible? Do you perform your physical examination while explaining what you are about to do? Are you conscious of your facial expressions and their messages? Do

you have good visual aids for patient education?

A visual world also demands different rules of etiquette. Deaf people will usually tell each other where they are going when leaving the room, even to use a toilet. Leaving the examining room without explaining

to the deaf patient will produce anxiety and may be considered rude.

When hands are so essential for communication, one can appreciate the gravity of a hand injury or the rage when a deaf person's hands are restrained.

In writing this article, I had two goals: 1) to alert clinicians to the cross-cultural issues separating them from their deaf patients; and 2) to spark interest in deaf culture and ASL. The table (see page 81) summarizes some steps to lessen the gap between the deaf patient and the hearing physician.

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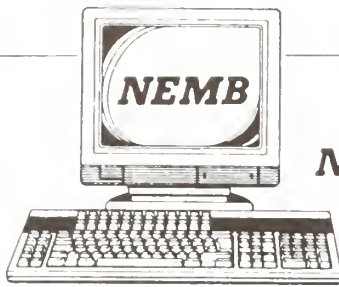
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to me:
You had a mother once, it says,
and she was tall with blue eyes, like you,
and she was beautiful and smart and
kind and good
and she died at thirty-six. Heart failure.
Her heart failed, it says, and I'm just
here
to remind you,
about fifty or sixty times a minute,
that anything could happen,
life is pretty random you know,
and sometimes beautiful kind young
women
don't make it to be thirty-seven
and they leave little daughters behind,
little smart bookish types who decide
they will grow up to be doctors
and tame the random world with sci-
ence.
And you know something, (it says,) you
can read your cardiology chapter of
Cecil's
six hundred times,
and decide that I don't mean anything
bad
but you'll never know for sure,
and sometimes, right before you go to
sleep,
you'll suddenly hear me loud and rough
in your ear and you'll think Oh God —
This is it. I'm dying too.
There's no reasoning with me, it says,
because I won't go away,
I'll be with you until the end
sooner or later, whenever it is,
swooshing behind your sternum as you
walk
into the CCU, saying:
You may be wearing a white coat, but
you can't hide.
Tomorrow this could be you.
Don't be complacent, it says,
don't leave anything important
undone —
I know. You think it's just a flow mur-
mur.
And you're probably right—
But my heart goes on murmuring just
the same.

Joanne Wilkinson

(Joanne Wilkinson, a Providence native, graduated from Lincoln School in 1987 and Brown University in 1990. She is currently a third year medical student and hopes to go into family medicine.)



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Collaborative Learning for Medical Student Development

Lynn C. Epstein, MD

"Education is what you have left over after you have forgotten everything you have learned."

Anonymous

The preferred blueprint for teaching physicians-to-be has changed greatly during this century. In 1910, when Flexner's illustrious report was published, emphasis was placed on a firm grounding in the scientific and mathematical aspects of medicine.¹ Since then, pre-medical students extensively pursued scientific studies that were then further enlarged during medical school years. Attention to "scientific medicine" was accentuated by concurrent research discoveries, by new conceptualizations of the human body normally and during disease processes, and by an explosion in medical technology.

Recently the pendulum has begun to shift. The Report of the Project Panel on the General Professional Education of the Physician (GPEP) and reports of other educational study groups, professional organizations and foundations have called for better educating the physician in two major realms: 1) the needs of the individual patient and family in the doctor-patient relationship; and 2) the societal issues, such as changes in population size and composition, as well as in health care needs and resources, that are so closely interrelated with physicians' decisions, behavior and performance in the larger, system perspective of medical care.²⁻⁸

Concomitantly, plans for national health care reform will affect medical education and training programs, as well as the required numbers, mix, practice structure, and location of physicians. The challenge to medical education to foster student development and to meet these needs is apparent.⁹⁻¹¹ As significant participants in the future health care system, medical students' functional knowledge, skills and personal

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qualities, as reflected in their behavior, have direct consequences for medical care.

The purpose of this paper is to profile collaborative learning, one of the strategies for promoting student development within the Affinity Group Program at the Brown University School of Medicine. Brown's Program in Liberal Medical Education (PLME) offers students a flexible 8-year educational continuum of undergraduate and graduate studies leading to baccalaureate and medical degrees. The PLME extends to medical education the open curriculum concept for which Brown has received recognition in undergraduate "general" education.

The Affinity Group Program encompasses the middle 4 years of the PLME program, the final 2 undergraduate years and the first 2 medical school years. Affinity Groups bring students together with faculty and upper-class medical student faculty assistants ("fellows") to provide opportunities for a wide range of learning experiences around areas of shared interests.^{12,13}

An underlying assumption in the design of the Affinity Group Program is that students' educational experiences affect their career choices. Accordingly, the program highlights active educational experiences, early clinical experiences, the ability to gather and manage information, emphasis on problem-solving skills, communication, interpersonal skills, self and peer evaluation, and mentoring opportunities.

Rationale for Using a Problem Based Approach in Affinity Groups

The medical education literature suggests that information garnered in a problem-based learning (PBL) format may be more readily integrated for later recall and use.¹⁴ Introducing students to clinical cases and problems early in their medical education appears to motivate them to investigate aspects relevant to the topics addressed. While some medical schools have made virtually a total commitment to this format, others have opted to supplement existing

... by addressing the process of dealing with problems rather than studying solutions, students gain the experience needed for addressing the future unknowns they will face during their professional careers.

curricula with the addition of select PBL programs.

Simply stated, problem-based learning is the act of acquiring knowledge in an issue-oriented fashion. It is an active process whereby a particular problem becomes the focus to define issues that require further delineation. The medical student must search for information that can be synthesized into a solution and, therefore, learns to recognize the complex and open-ended nature of medical questions.

For example, a wide range of issues was introduced regarding the case of a 23-year-old Hmong man who died 4 days after being admitted to Rhode Island Hospital complaining of chest pain. An autopsy was conducted despite his family's vigorous protests. Besides the usual textbook (anatomy, physiology, pathology, etc.) and library inquiries, students spoke with members of the local Hmong community, visited the medical examiner's office, spoke with the hospital and debated state law versus individual rights. Articles on the case in *The Providence Journal* helped impress upon students the practical realization of the complicated nature of these interactions.

A basic tenet of PBL is that knowledge, while central to medical practice, is of scant value unless the student is able to use it. The goal is not only to recognize and define problems, but to gather additional data as required and to evaluate the solutions generated. A corollary of the above is that structuring the learning situation to approximate the setting for its use facilitates practical application of what has been learned. Similarly, when a student identifies the necessity of subjecting certain issues to an information search, the motivation for learning is heightened and the findings more

ABBREVIATIONS USED

CD ROM: Compact disc—read only memory

GPEP: General Professional Education of the Physician

PBL: Problem-based learning

PLME: Program in Liberal Medical Education

likely to be retained. Active participation by the student is central to the process whereby data is understood, assimilated and retrieved.

Information theory proposes that the acquisition of new facts and concepts is facilitated by three main principles: 1) activation of prior knowledge; 2) encoding specificity; and 3) elaboration of knowledge. All learning builds on previous experience, and making connections between the new and the old creates meaningful bridges. Later retrieval is promoted when the learning situation resembles the circumstances to which one needs to apply what has been mastered. For example, seeing a patient with diabetes while learning about the illness and trying to explain the intricacies of proper management to the patient, aid a student in gaining a functional understanding of diabetes. Actively involving the student prompts insights and appropriate applications.

Problem-based learning can take place both individually and in groups. Consideration of a series of biomedical problems in a small group setting has been found to be a useful format for PBL within the medical curriculum. Advantages of this format are that learning is optimized by linking activities with prior knowledge, the close resemblance of the learning context to professional applications, and the active participation by students as they elaborate on their knowledge base.

Practical Applications

Within affinity groups, the small group setting becomes a vehicle for learning group dynamics as well as effective functioning with others. By working together on each "puzzle," students develop interpersonal skills, collaborate in group problem-solving, have an opportunity for self-evaluation and learn to offer and receive constructive criticism. Students decide together the pertinent issues on a respective case and then develop a strategy for gathering the necessary information. The faculty person serves the role as a facilitator. As such, managing small-group interaction is a vital skill. The facilitator helps the group to become more responsible for learning activities. When the group addresses a problem, the facilitator assists the group with its task, not as an expert with pieces of information, but rather as a catalyst to the process.

On a given health care problem, students follow a number of steps as they grapple with the issues. An example is the case of a 49-year-old woman who suffered massive brain damage after a cerebral hemorrhage and remained in a "persistent vegetative

state" for several years. The family finally asked the hospital to withdraw life support systems. When the hospital refused, the family petitioned the court. Students generally begin the process with problem definition, clarification and analysis. (What is going on here? What is the problem?) This is followed by the development of hypotheses that might explain the phenomena and clarification of the issues involved (biological processes, legal and ethical domains, and so on). Next, students identify knowledge already possessed by the group and generate a list of areas for further investigation. Students subsequently identify learning resources, eg, textbook and library, interviews with family members, hospital officials, position of the court, etc. Ultimately, this leads to the collection of new information, that can be integrated with the existing knowledge base to better understand the original problem.

As the group reviews the problem, they may need to repeat some or all of the previous steps until a satisfactory resolution is reached. The final phase is a summary of what has been learned, identification of what was not learned, specification of possible applications to other problems, and an evaluation of the functioning of the group and the individuals comprising it in the endeavor. Depending on the problem addressed, students frequently need to explore the issues directly with a patient or participant, explaining what is going on, possible implications and options. Students were able to follow details of this much publicized case in the local newspapers.

Within the Affinity Group Program, students build a progression of skills in PBL that takes them from a problem or case to interviewing patients or family members, to teaming with other health professionals, and ultimately to an examination of the larger system ramifications of problems and issues.

Use of Resources and Information Management

Students need to learn basic information retrieval and research skills, as well as information management during their undergraduate years to function effectively as professionals. While some students are proficient in accessing information, many are not effective in so doing. Accordingly, the importance of teaching medical students the uses of new technologies in information gathering and management is considered critical to their life-long education.² Since the implementation of the Affinity Group Program in 1987, there has been close collaboration between the student and faculty

participants and the medical librarian coordinator, with particular emphasis on familiarity with the new information technologies (eg, the use of CD-ROM, accessing and searching various on-line data bases, such as MEDLine). A sequentially administered, problem-based library research instruction plan during the 4-year program provides students with opportunities for supervised, first-hand experiences with on-line databases and management programs.

Communication and Interpersonal Skills Development

Taking advantage of the small group format and early interactions with patients, the Affinity Group Program works with communications consultants to develop students' abilities to communicate effectively. Typically, the groups focus initially on the interactions among peers within groups and then enlarge the scope to include a communications component, with role plays, simulated patients, videotaping, etc. An example would be using an actress to simulate a woman who has just been raped and having a student, as a member of the emergency room team, interview her. With the premise that communicating effectively is a skill that can be taught, the participation of communication consultants in the Affinity Group Program has increased.

The consultants meet with groups generally to observe interactions and offer comments. In early years, this typically takes the form of helping heighten students' awareness of verbal and nonverbal messages, as well as developing methods for giving and receiving comments constructively. Consistent with program philosophy, guidance and skill-building in communications take an active format, with modeling a key ingredient. Students are asked first to evaluate their performance before obtaining comments from the other students, the faculty and possibly consultants. As groups get more involved in clinical situations and community projects, consultants are instrumental in helping students tailor their language to their audience and gauge its reception. Students come to realize that it is the perception of their words, rather than the intent, that is ultimately measured.

An important program aspect is to have students deal with clinical problems, role plays, and interviews with actors at a point where their ignorance of technical intricacies generally prevents them from insulating themselves from patients with medical jargon. Rather, they are encouraged to see how complicated the personal aspects of illnesses are for patients and for family members, while they grapple with the diffi-

culties of explaining what is going on and what it means.

Awareness of Larger Societal Aspects of Medicine

Doctors do not deal with their patients and their families in isolation. Instead, health care is provided by multidisciplinary, professional teams of which doctors are just one of the members. Health care services are increasingly part of planned or managed systems of care, in which physicians are important links. As such, it is essential for students to have learning experiences that hone their skills to network and to function as effective team members, whether they are leading or following others.

Moreover, students need opportunities to explore issues surrounding the organization and delivery of health care: access, financing, quality assurance, ethics, and system structure. Regardless of the specific interest area of the Affinity Group, students have opportunities to explore system issues. An example would be the case of a 14-year-old who gives birth to a premature infant with multiple birth defects, including Down's syndrome and a serious heart valve malformation. The mother, who is on welfare, believes the baby should be allowed to die, despite religious convictions that preclude so doing. She lives with her 29-year-old mother and her legal guardian, who wants to provide all possible care to the premature baby. Decisions about care, which are risky as well as costly, must be made by the guardian(s). Students must work with supporting hospital staff, social workers, religious counselors, as well as professionals at community agencies, who are often best able to address the ramifications of the problems. In the process, students become more aware of the "different levels" of impact, (the individual, the family, the societal), as well as the need to network appropriately.

Implications

By devising a longitudinal, small group program to bring students and faculty together around areas of interest, Affinity Groups provide a safe environment for students to develop personally and professionally. The early exposure of students to clinical problems and cases helps sensitize them to extensive psychosocial, environmental and ethical issues. Furthermore, integrating the curriculum around a problem format beginning in the undergraduate years helps to provide a cohesive and logical relationship between undergraduate and medical education, between basic science knowl-

edge and clinical medicine, and between psychosocial and ethical issues in health care delivery.

The flexibility of groups allows students to identify and explore in depth areas of scholarly interest for which other opportunities may not be available within the curriculum. In so doing, students develop mechanisms to foster and maintain their interest areas throughout their training and professional careers. Concurrently, consultants work with students to advance skills development in the areas of problem solving, the use of resources, information management, effective communication, evaluation, teaming and group functioning.

The practice of medicine is subject to modifications just as is the information and technology on which physicians rely. Whether in terms of the shifts in population

demographics, the need for heightened sensitivity to psychosocial perspectives and cultural beliefs, or whether in terms of the organization of practice to address issues of access, cost and quality, effective physicians should be able to keep up with changes and should play an active role in pioneering them. As outlined above, the rationale for using a collaborative learning approach in the Affinity Group Program is to create a structure where students, working in small groups in a close mentoring relationship, experience first-hand the challenge of achieving and monitoring their growth in effective communication, problem-based learning, early clinical experiences, and so on. Faculty then facilitate the process, advancing students' skills to respond appropriately over time to new intellectual and social challenges. Osler advocated a similar

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approach, cautioning that: "The successful teacher is no longer on a height, pumping knowledge at high pressure into passive receptacles . . . but he is a senior student anxious to help his juniors."¹⁵

Throughout their pre-medical and medical studies, students acquire a substantial grounding in the science of medicine and how to use it effectively, necessary though not sufficient to becoming a physician. The emphasis on true integration to form a biopsychosocial approach has helped renew dedication to the human side of medicine. A key element in the Affinity Group Program is promoting student development of active learning patterns, critical thinking and effective communication. This approach encourages the blending of the biological sciences with the social and behavioral sciences. It is hoped that through these experiences, students will develop a lasting appreciation of the need to maintain the art and science of medicine in tandem.

Rather than studying solutions, students need to cultivate an approach for addressing the future unknowns they will face during their professional careers. It is unnecessary (and impossible) to give medical students all the information they need to know for a lifetime. The task of medical education is to provide students with an appropriate background to begin the process of active inquiry: to teach them that when they have forgotten the particulars, they still have their education on which to rely.

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Primary Locations of Motor Vehicle Crashes in RI, 1988-1991

Motor vehicle crashes are a major cause of death and disability in Rhode Island. Reducing these highway injuries is a primary concern of both the Department of Health and the Department of Transportation (DOT). These two agencies collaborated on a surveillance project to identify intersections in Rhode Island where crashes were most frequent during 1988-1991. The top five locations were then studied in detail regarding crashes occurring during 1990-1991 to determine risk factors for these events.

The five areas where crashes were most frequent are illustrated in Figure 1. Table 1 lists the number of crashes and crash rate per million entering vehicles for 1990-1991. While crashes were most frequent at the I-95-I-195 interchange in Providence, the crash rate per million entering vehicles was the lowest of these five. The crash rate at the I-95-RI-146 Providence interchange was also relatively low. Among these five locations, vehicles entering the intersection of Hartford Avenue and Atwood Avenue in Johnston were at highest risk of crash involvement.

During 1990-1991, 806 people were involved in the 450 reported crashes at the five locations. Of these, 255 (32%) were noted to have sustained an injury. Table 2 provides a profile of injury severity for the 195 injured persons for whom severity was specified. Fatalities may be undercounted since injury severity is reported at the scene. Deaths occurring subsequently would not have been captured.

Local police concurred that these were problematic areas within their jurisdictions. Providence police stated that the I-95 interchanges were hazardous due to congested merging zones. The data support this viewpoint as the two I-95 interchanges had the highest proportions of sideswipe collisions. According to Johnston police, many crashes at the intersection of Atwood Avenue and Hartford Avenue were due to the lack of a left-turn signal at the intersection, an excessive number of entrances onto Atwood Avenue, and only two travel lanes on Atwood Avenue south of Hartford Avenue. Warwick police reported that problems at Hoxsie Four Corners have been alleviated through environmental modifications such as the widening of Warwick Avenue. They also reported that crashes at Post Road and Airport Expressway may be due to excessive traffic inadvertently traveling past the airport terminal when exiting Airport Expressway.

Several limitations were noted in using

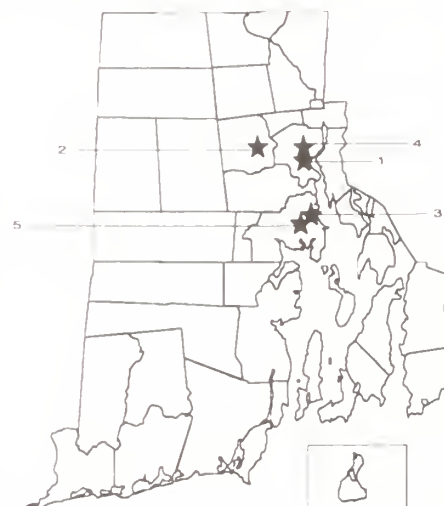


Fig 1.—Location of the five leading crash frequency intersections, Rhode Island, 1988-1991. Key: 1. I-95 & I-195, Providence; 2. Hartford Avenue & Atwood Avenue, Johnston; 3. Hoxsie Four Corners, Warwick; 4. I-95 & RI-146, Providence; 5. Post Road & Airport Expressway, Warwick

Table 1.—Summary of the top five crash frequency intersections, Rhode Island, 1990-1991 (rates are per million entering vehicles)

Crash Site	Reported Crashes	Crash Rate
I-95 & I-195 Providence	119	0.69
Hoxsie Four Corners Warwick	98	2.2
Hartford Ave. & Atwood Ave. Johnston	93	3.1
I-95 & RI-146 Providence	83	0.71
Post Rd. & Airport Expressway Warwick	57	1.9

The primary source of data was the Accident Location Reporting System (ALRS), which is maintained by DOT to locate the state's most hazardous intersections and help prioritize design projects. For this analysis, the ALRS provided information on driver and crash characteristics in addition to incident location for events occurring in 1990-1991. Information was also obtained from DOT regarding traffic volume at intersections, and design modifications in progress or planned for those locations. State and local police in jurisdictions of identified intersections provided information on levels of patrol and descriptions of hazardous designs or traffic patterns.

Table 2.—Reported injury severity for crashes occurring at the five leading crash frequency intersections, Rhode Island, 1990-1991

Injury Severity	Reported Number	%
Fatal	1	0.5
Bleeding or Fracture	12	6.2
Bruises or Abrasions	49	25.1
Complaint of Pain	133	68.2
Total	195	100.0

this one data source, including suspected failure to report crashes to DOT, validity of self-reported information by drivers, and the difficulty in identifying some locations (ie. where roads intersect more than once). Copies of the report "Primary Locations of Motor Vehicle Crashes in Rhode Island, 1988-1991," are available from the Injury Prevention Program in the Department of Health (277-2901).

THE RHODE ISLAND MEDICAL JOURNAL

The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

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NUMBER I

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (March 1904)

The lead editorial describes further plans for the reorganization of the Rhode Island Medical Society. A second editorial decries the contamination of the Providence River and upper Narragansett Bay shellfish beds by urban sewage, estimated to be about 14 million gallons per day, and industrial runoff.

C.A. Fuller, PhD, describes sewage flow into Narragansett Bay and the resulting contamination of oysters principally in beds located between Warwick Neck and Bullock Neck. The author details the progressive spoilage of the river and bay, noting that vast amounts of untreated sewage from the Fields Point sewer outlet are released each day with visible sewage strewn over the beaches of the lower bay. Sewage from Fall River, via the Taunton river, and mill waste from Warren contribute materially to this pollution. An extensive bacteriologic survey of water and oyster samples was undertaken. The author states: "nearly every sample of water taken within a mile of the city sewer outlet contained *B. coli*. Also, clams, mussels, and oysters from this section of the river contained this organism within their shells." Samples taken beyond 7 miles of the sewer outlet were free of coliform organisms.

A case of cesarean section in a difficult labor resulting from ventrolateral fixation of the uterus is presented by Charles W. Higgins, MD. The purpose of this case report is to illustrate the serious difficulties that may arise when prior ventral suspension of the uterus (with broad adhesions between the uterus and abdominal wall) may complicate subsequent pregnancies.

John W. Keefe, MD, discusses nephrolithiasis—either interstitial, parenchymatous or within the pelvic portion of the kidney.

Various inciting circumstances are noted, for example, "colon bacillus exciting a catarrhal inflammation, the products of which favor crystallization and precipitation forming the nucleus of a calculus." The most common varieties of stone, states the author, are the uric acid, phosphatic, calcium oxalate, and cystin calculi. The progression from tubular precipitates to larger calculi is then described. Movable stones, it is observed, lead to the most severe symptoms. If large enough, the calculus may result in obstruction, hydronephrosis, pyelitis, pyelonephritis and/or pyonephrosis. The diagnostic value of Roentgen ray study is noted. The clinical details of two cases are outlined. In the first case, X-rays showed a probable calculus in the upper ureter. A waxed ureteral catheter was passed, and when removed, the wax was scratched providing presumptive evidence of the presence of a stone. This was verified during subsequent surgery. The second case was that of a 33-year-old woman with pyonephrosis.

50 Years Ago (March 1944)

The lead article on acute respiratory diseases is written by Alex M. Burgess, MD. The author stresses those respiratory disorders caused by viruses—particularly influenza and the common cold. In reviewing the cycles of influenzal epidemics, he notes that the incidence of lobar pneumonia rises significantly during such outbreaks of influenza. After reviewing the seasonal epidemiologic patterns of influenza and pneumonia in the civilian population of Providence including the Brown/Pembroke student body, he dwells upon therapy, particularly the use of sulfadiazine and sulfamerazine in cases of bacterial pneumonia, but he decries and condemns the indiscriminate use of sulfanomides, noting the many complications of sulfonamide use including rashes, renal block, hematologic changes and drug sensitivity reactions.

The second paper, by Henry E. Utter, MD, discusses sulfonamide therapy of res-

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piratory diseases in childhood. The author defines the general indications, and pediatric dosage, for the use of sulfonamides and particularly in the presence of viral infections (debating whether there is merit in its use as a preventive agent). Finally, the author reviews the use of sulfonamides in children with rheumatic fever.

Russel O. Bowman, PhD, offers a paper on the chemotherapy of pneumonia, noting that at the time of writing there are four general categories of chemotherapeutic agents: 1) the hydroxyethylapocarpines; 2) the tyrothricins (deemed too toxic); 3) penicillin (with very limited supplies); and 4) the sulfonamides. The paper then summarizes the various toxic reactions, particularly to the sulfonamides. Finally the author stresses that only the laboratory can answer questions such as: What is the blood level of the drug? And, what amount of drug is needed to assure good results?

The major recommendations of the Welfare Commission, authorized by the General Assembly, are summarized in the *Journal*. These recommendations pertain to such medical facilities as the various state hospitals for the mentally ill, the tuberculous, the criminally insane as well as the general infirmary. These facilities collectively house 4,980 Rhode Islanders.

An editorial expresses opposition to the pending Wagner-Murray-Dingell Bill before Congress.

The *Journal* lists the names of the 162 Rhode Island physicians in active military service (a few so listed, after 50 years, are still active in the medical affairs of this state).

25 Years Ago (March 1969)

The lead article discusses infectious mononucleosis complicated by thrombocytopenic purpura and is authored by Annach Sviratanaban, MD, John E. Farley, MD, and Maurice M. Albala, MD. The case of a 7-year-old female with the abrupt onset of hepatosplenomegaly, lymphadenopathy, leukocytosis, anemia and thrombocytopenia (initially suggesting leukemia) is analyzed. The diagnosis is established by appropriate laboratory tests. The authors speculate that the thrombopenic purpura, a rare complication of mononucleosis, might be the result of hypersplenism or perhaps the platelet damaging effect of an unidentified virus that seems to be associated with this illness.

Edward A. Iannuccilli, MD, and Walter R. Thayer, MD, discuss autoimmunity in pernicious anemia, and particularly the role of parietal cell antibodies, intrinsic factor antibodies, gastritis, certain genetic predispositions (suggesting the role of an autosomal, dominant gene) and thyroid disorders. They conclude that the evidence indicting pernicious anemia as an autoimmune disease remains circumstantial.

Four cases of congenital nonspherocytic hemolytic anemia at Rhode Island Hospital are described by Edwin G. Taft, MD, and Maurice M. Albala, MD. The authors stress the dominant role of various enzymatic deficiencies (and particularly, the initiating effect of certain drugs such as the sulfonamides upon this phenomenon).

H. Richard Tyler, MD, discusses the cerebrovascular complications of certain forms of heart disease, especially congenital, rheumatic and coronary heart diseases.

William J. MacDonald, MD, in his retiring address as president of the Providence Medical Association, recommends the consolidation of all obstetrical services in Greater Providence.

Editorials discuss a new tool for clinical investigation called radioimmunoassay as well as the biological basis for the Narragansett Bay "red tide," namely a thermostable neurotoxin elaborated by *gonyaulax*, a genus of dinoflagellates.

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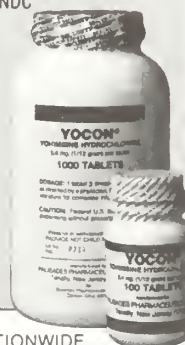
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1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

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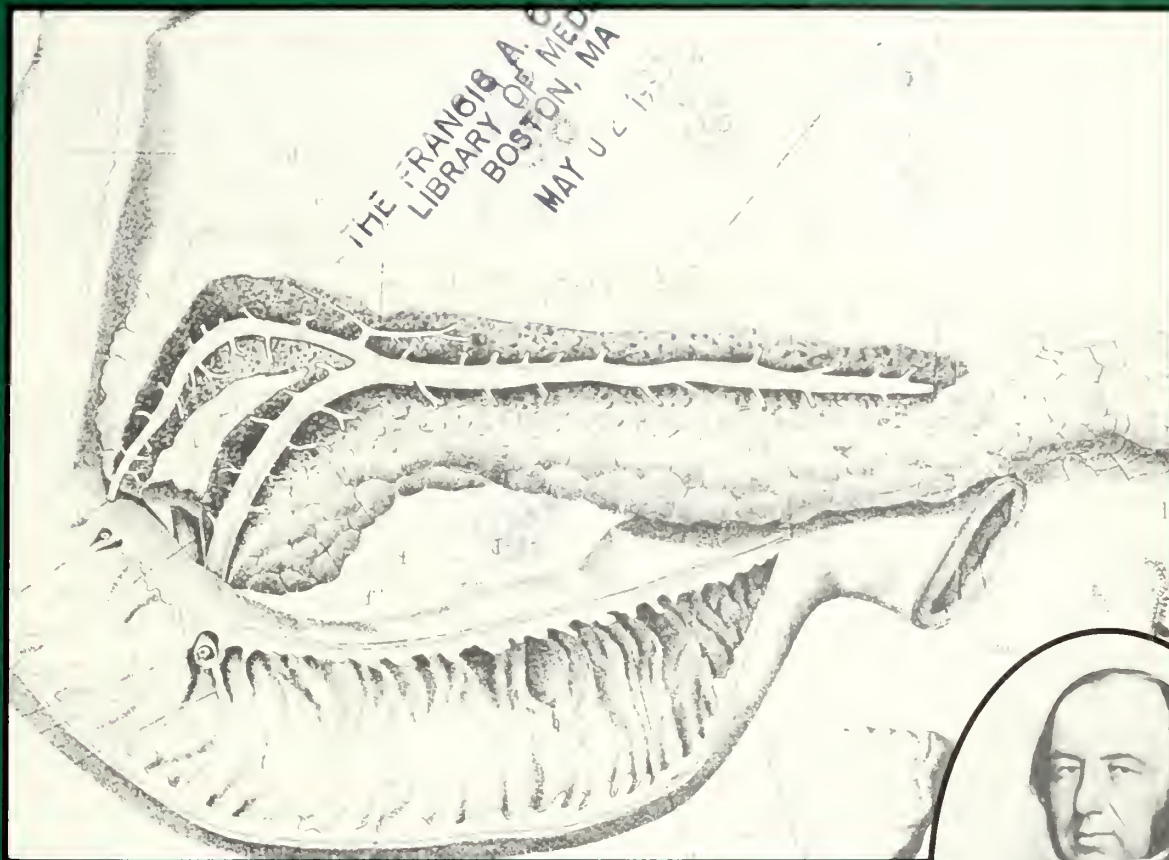


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Cover: Dissection of pancreas, from Claude Bernard's 1856 text on the pancreas.
Inset, Claude Bernard (1815-1878).



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The Realities of Pancreatic Disease

The pancreas is an elusive organ, difficult to investigate and even more difficult to heal when diseased. Management of inflammatory and neoplastic diseases of the pancreas too frequently remains both frustrating and refractory. The exact trigger mechanism causing acute pancreatic inflammation is uncertain, while the outcome in severe pancreatitis has not improved greatly in recent years despite sophisticated intensive care unit treatment and advances in radiographic procedures as well as diagnostic and interventional endoscopy techniques. Therapeutic nihilists bemoan the absence of effective treatment for pancreatic adenocarcinoma, a disease that yearly attacks 28,000 Americans and results annually in more than 25,000 deaths. A recent edition of a standard medical text, discussing cancer of the pancreas, states: "Most of the current diagnostic studies, which depend upon development of symptoms for their application, serve to confirm only a sentence of death."

This issue of RHODE ISLAND MEDICINE highlights our current knowledge in the diagnosis and management of clinical problems relating to the pancreas. Emphasis has been placed upon common problems including the differential diagnosis of hyperamylasemia, the value of biliary scintigraphy, and the evaluation and management of gallstone pancreatitis. Because interventional techniques have been employed in the treatment of pancreatitis, a review of one of these aspects has been included in this issue. Finally, a comprehensive analysis of the management of pancreatic cancer is presented.

One exciting area not discussed is the explosion of knowledge concerning secondary pancreatic infections, the major determinant of death after acute pancreatitis. The older dogma (circa 1980) stated that all purulent pancreatic collections were to be

termed "pancreatic abscess" despite the apparent fact that different patterns of infection existed. In addition, classical teaching held that prophylactic antibiotics were not beneficial and, perhaps, were deleterious in acute pancreatitis. A new game with new rules is now emerging as traditional precepts of pancreatic infection change.

Ineffectiveness of prophylactic antibiotics in preventing intra-abdominal sepsis in acute pancreatitis has been demonstrated in at least five controlled, randomized trials. Early studies, however, used antibiotics (such as ampicillin) now known not to appear in therapeutic concentrations in either pancreatic tissue or juice. Research in this field has continued, principally because infections involving injured pancreatic and peripancreatic tissue seem to be a secondary phenomenon, theoretically preventable by antibiotics given before infection has developed. Recent evidence from studies using newer antibiotics (eg, imipenem or the quinolones), which achieve high concentrations in pancreatic juice and parenchyma, support this contention. Two recent, randomized trials of patients with pancreatic necrosis found that imipenem-treated patients developed significantly fewer infections than did placebo-treated controls.

These recent antibiotic studies required the development of newer antimicrobial therapies as well as a more sophisticated understanding of the nature and variety of infections arising during acute pancreatitis. Pancreatic infection is now seen as inherently different than other surgical infections. In pancreatitis, necrosis and inflammation are ongoing processes in the presence of continued enzyme release, ductal disruption, and continued release of vasoactive substances for as long as two weeks after an initial insult. Furthermore, infected pseudocysts, pancreatic abscesses and infected pancreatic necrosis are now understood to be distinct entities with varying presentations, treatments, and outcomes. Intensive investigation, including ongoing

clinical trials, is attempting to answer pertinent clinical questions about pancreatic necrosis including: how frequently necrosis develops, how often it becomes infected, and whether sterile necrosis is an indication for surgery.

Edward R. Feller, MD

The Pancreas

The pancreas, observed one Roman, was created expressly to provide humans with a culinary delicacy. Certainly neither the Greeks nor their immediate Mediterranean successors assigned any particular physiologic function or special purpose to this bland-looking retroperitoneal mass. The Hebrews did not even bother to give it a separate name, referring to it merely as the finger of the liver. Its current name (from the Greek, meaning all flesh) was first proposed by Rufus of Ephesus, a 1st century anatomist. His choice of a name reflected the classical perception that the pancreas lacked any distinguishing structural feature or reason for being.

The vernacular English term for the pancreas, sweetbread, has been widely used for 5 centuries, although its derivation remains obscure. By the 18th century, the thymus—as well as pancreas—were jointly referred to as the sweetbreads; and, according to the Larousse *Gastronomique*, these parts of the calf (*ris d'agneau*) were to be appreciated "... as the most delicate product of butchery." However, it awaited the genius of a 20th century poet, Ogden Nash, to immortalize this prosaic organ as an object of gourmet interest:

That sweetbread gazing up at me
Is not what it purports to be.
Says Webster in one paragraph,
It is the pancreas of a calf.
Since it is neither sweet nor bread,
I think I'll take a bun instead.

The allegedly featureless pancreas elicited meager attention until the renaissance

treatises of Fallopio and Vesalius. Additional studies revealed a number of anatomic features: In 1642, at Padua, Johann G. Wirsung described a linear duct traversing the organ and sharing a common duodenal orifice with the bile duct. Exactly a century later Santorini defined the accessory duct within the organ. Wharton, in the 17th century, was struck by the similar lobulations in both the parotid and pancreatic glands and suggested that each might be exocrine glands contributing substances to facilitate digestion. In 1720 Abraham Vater, working in Wittenberg, described the duodenal ampulla, which to this day bears his name.

The exocrine functions of the pancreas were meticulously explored by Claude Bernard (see cover) culminating in his great 1856 text "*Memoire sur le Pancreas et sur le Role du Suc Pancreatique dans les Phenomes Digestifs*." Bernard concludes: "I have demonstrated experimentally . . . the action of pancreatic juice on fats and other substances, and it is apparent that the action of the juice extends to three groups of substances in the diet, ie, fats, starch and albuminous compounds. We cannot infer from this that pancreatic juice is a universal digestive juice, because it will only produce its effect when it is part of an orderly procession of digestive fluids."

There were hints, as early as the 17th century, that the pancreas fulfilled more than an exocrine function, but it was during the three scientifically productive decades between the von Mering-Minkowski experiments of 1889 and the isolation of insulin by Banting, McLoed, Best and Collip in 1921 that this conjecture was converted to defensible reality. In 1683 Brunner had published a brief note stating that the pancreas must possess a necessary function; indeed it must be vital to life since its removal in dogs resulted in excessive thirst (polydipsia), excessive urination (polyuria) and early death. These insights languished for 2 centuries until von Mering and Minkowski restudied the effects of total extirpation of the pancreas in dogs that included the same signs noted by Brunner as well as a terminal ketosis. In the postoperative interval, Minkowski's animal care-

taker mentioned that swarms of flies were selectively attracted to the voided urines of the dogs subjected to pancreatectomy. These urines were then examined for the presence of sugar, leading eventually to the recognition that experimental pancreatectomy may cause diabetes mellitus. Just 2 decades before, a young medical student named Paul Langerhans had submitted his doctoral thesis in which he described small (0.2 mm) islands of transparent cells (*Zellhaufen*) scattered throughout the substance of the pancreas. He could suggest no purpose to these cell clusters. Following the experimental studies of Minkowski and others, Laguesse predicted that these islands of cells would be shown to fulfill an internal secretory function related to carbohydrate metabolism.

A flood of observations followed Laguesse's 1893 conjecture showing an intimate relationship between these islet cells and clinical diabetes—but also the role of other organs such as the pituitary and adrenal glands in mediating carbohydrate metabolism. A paper, published in 1920 by a Minnesota physician, Moses Barron, detailed the pathologic evidence that damage to islet tissue resulted in diabetes mellitus and that pancreatic extract free of its exocrine substances might then be of therapeutic value in natural diabetes. This paper prompted a young Toronto physician Frederick Banting to abandon his interests in orthopedic surgery and begin (with the help of a medical student named

Charles Best) the quest for the elusive pancreatic endocrine factor. Best's interests in the pancreas were two-fold: It provided him with an outlet for his consuming commitment to physiologic research; and his aunt, a Boston nurse, had recently died in diabetic coma.

In 1921 the Toronto research group, working in McLoed's laboratories, isolated a substance from beef pancreas that could lower blood sugar levels in experimental animals. Within a year it was tried on a human diabetic (Leonard Thompson, January 11, 1922). They called their substance isletin but then accepted an earlier suggestion by Sharpey-Schafer (1916) that it be called insulin.

Of the many clinical features regularly associated with diabetes, it was the polyuria that consistently prompted identification of the disease in antiquity. Indeed, the Greek word *diabetes* translates as a going through or an excessive flow (of urine). Aretaeus, the Cappadocian, said the following of dia-

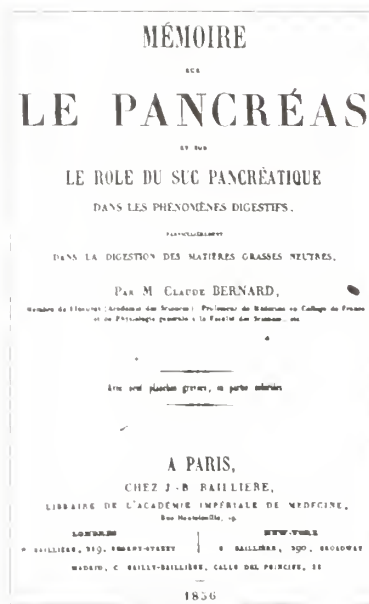
betes: "... for the patients never stop making water, but the flow is incessant, as if from the opening of aqueducts." Of companion interest is his observation that diabetes is similar to the bite of the viper, *dipsas*, "... which kindles up an unquenchable thirst." There is indeed a genus of nonpoisonous snakes called *Dipsadomorphidae* but no current evidence that their bite provokes any polydipsia. (The Greek word for thirst is *dipsa*.) There is no mention of any diabetic glycosuria in the early Egyptian or Greek treatises of the disorder. Both Chinese and Hindu physicians described diabetes (the malady of thirst) adding two further clinical features: the sweetness of the urine; and a heightened susceptibility to furunculosis. Avicenna added impotence and limb gangrene as additional elements of the disease.

Willis recognized two forms of diabetes: those cases associated with sugar in the urine (later called diabetes mellitus by Cullen) and that form with a tasteless urine (later called diabetes insipidus). Willis, forswearing his scholarly training in classical languages, elected to call diabetes the Pissing Evil in his 1674 text on clinical medicine. Other short-lived names for diabetes mellitus included: licenteria urinalis, profuvium urinae, and dipsacus.

Historic events sometimes provide temporary windows of insight into the nature of certain diseases. In 1870 Paris was under prolonged siege during the final days of the Franco-Prussian War. Famine overspread the city. Bouchardat observed the curious fact that his diabetic patients, on starvation rations, actually showed clinical improvement. Controlling the food intake of diabetics remained the sole means of prolonging their lives until an effective hypoglycemic agent could finally be isolated. In the 7 decades following the seminal work of Banting, Best and colleagues, numerous therapeutic and pathophysiologic advances have been established. The islet cells were shown to be of three types elaborating respectively insulin, glucagon and somatostatin. Ways of prolonging the effects of injected insulin were devised, and oral hypoglycemic agents were discovered.

For millennia, the pancreas was disparaged as a purposeless piece of flesh best employed as a grilled hors d'oeuvre. Yet since 1921 at least five Nobel prizes have been awarded for insights into this hitherto banal organ (Banting, McLoed, Sanger, Hodgkin, Yalow).

Generations of London medical students have called the St Pancras Railroad Station near London University the "Pancreas." It is most unlikely that young Pancras knew much about the pancreas—or even about



London. He was a 4th century Phrygian orphan brought to Rome, converted to Christianity and later martyred through beheading by Emperor Diocletian. Centuries later, St Augustine, remembering this young man, dedicated a rude chapel in London to his memory. The chapel has since been supplanted by a cemetery; the cemetery by a railroad station; and the memory of an obscure, martyred youth somehow merged into an organ of unsurpassing complexity.

Stanley M. Aronson, MD

A Meeting of Minds

You have just been chosen to supervise continuing medical education programs at Narragansett General Hospital. Your first programmatic choice is a 2-day effort reviewing newer aspects of sports medicine. A fine group of speakers is lined up, and you are about to assemble a descriptive brochure when a minor impediment arises: What inclusive word should you use to portray your educational program? Is it a conference, a seminar, a congress, a session, an assembly, a conclave, a mere meeting, a retreat, a forum, a convention, an exercise, perhaps even a symposium? These names, at first glance, seem essentially interchangeable in meaning. Yet there exist notable differences particularly when their etymological roots are explored. While time has tempered these differences in meaning, some distinctions in current usage nevertheless persist.

Many of these synonyms of "meeting" begin with the Latin suffix *con-* signifying "with" or "coming together." We have such common nouns as congress (L. *congressus*, to step together); convention (L. *convenire*, to come together, to assemble); conference (L. *conferens*, to bring together, to share conversation, to bestow thoughts); convocation (L. *convocatio*, to call together); consistory (L. *consistorium*, a place to stand together); and conclave (L. *clavis*, a key; literally, persons locked up together, as in the case of Cardinals about to elect a Papal successor).

Yet another way of viewing these many quasi-synonyms is by noting that some serve to describe *the place* of the meeting rather than *the participants* who undertake to meet. In the former group are names such as conclave, consistory, plenum (L. *plenum*, a filled space, its opposite being *vacuum*), forum (L. *forum*, a market place, particularly an open law court) and even synagogue (Gk, bringing together).

Many verbal equivalents of "meeting" have their roots in the administrative and spiritual evolution of Christianity. We have

the obvious ones such as conclave, convocation, consistory and synod—while even the secular word, "convention," hints at some religious association in the related word "convent."

Some synonyms of "meeting" have more complex origins. The term "seminar," for example, is a descendant of the Latin *seminarium*, a nursery garden; literally, a place for the development of seeds (cf. Latin, *semen*). Thus, a garden evolved into a place where serious study—again, often religious—could be conducted without distraction. Its ecclesiastic roots can be perceived in companion words such as seminary and seminarian. In 19th Century European universities, a specially designed class for advanced students undertaking research in some secular field was called a seminar, a narrowed meaning that persists in today's graduate schools. A "symposium," on the

other hand, has a more ribald and lusty origin. It is of Greek derivation (*symposion*) meaning to drink together, classically a convivial gathering for drinking and, perhaps, some intellectual entertainment.

A "session" (Latin, *sedere* to sit) conveys the sense of a temporally defined form of gathering (as in phrases such as afternoon session, or, summer session) suggesting that it is a contributory element within a larger educational effort. And yet this quiet, unassuming word, session, has been preserved for all times in Shakespeare's 30th sonnet: "When to the sessions of sweet silent thought I summon up remembrance of things past."

The earlier cookie-cutter meaning of assembly (Latin, *ad-+ simulare*, to make the same) is more faithfully preserved in a phrase such as "an assembly line" than in "an assembly of scholars." An assembly, in its



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primitive meaning, was a place where persons of disparate beliefs could be made to think identically. Still, the right of assembly, in its non-brain-washing connotation, is carefully protected in Article I of the US Constitution as a fundamental right of a peaceable people, not to be abridged by Congress.

There are, of course, those synonyms that are unhindered by any classical baggage; words such as "gathering," or "meeting," or "get together," even "caucus" or "powwow." They work as competently as their Latin cousins, are less self-conscious, and blessedly bear fewer subliminal associations. None of them, however, are totally free of churchly colorings. Non-conformist congregations in both England and New England (eg, Quakers) called their places of religious assembly not churches but "meeting" houses; and the Congregational Church membership traditionally referred to its congregation as a "gathering."

Conflict between words remains an added consideration. The word "retreat," for example, should be adopted as a name for a scientific meeting but with caution, given that it may have to compete with many "recent advances."

We return then to the problem: which one of the many available names should be chosen? Some of these words have already found special niches for themselves (variously theological or political) and can be of little use in the naming of a medical gathering other than to convey a sense of irony or preciousness. And while most of these words are used without much discrimination, we should nevertheless be sensitive to any residual differences in their meaning. For example, calling a weekly surgical staff meeting a consistory sounds either pompous or outrageously sarcastic; similarly, calling a conference on male infertility a seminar or an alcoholism therapy session a symposium shows either gaucheness or insensitivity. A conclave is certainly not the same as a tryst—although both are meetings of a sort and both may occur behind locked doors; and when seeking a suitable title for the annual meeting of plumbing appliance manufacturers, a "convention" sounds intuitively more suitable (perhaps even more conventional) than a "forum."

A scale of these synonyms might be constructed with the most informal at one end and the most imposing at the other. Your choice might then ultimately rest upon the grandeur you wish to invest in the contemplated meeting and whether its proceedings will be published. Current day medical congresses (especially those with Roman numerals after them) tend to end up in print. But even here some caution must be exer-

cised: the first usage of the word "congress" to signify a formal gathering of delegates to address a specific problem was found in the proceedings of the Massachusetts Assembly of 1765. Before that time the word referred largely to the flocking of birds and the liaisons (typically of a sexual nature) between individuals.

Depending then upon the nature of the gathering—whether deliberative, legislative, ecclesiastic, social or educational—

we have a rich menu of names from which to choose. But the choice of this name, like most packaging efforts, resolves eventually to the minor niche that it deserves. This CME brochure, with its elegant title, serves only to provide its readers with names of authors and subjects, and it will inevitably be discarded before sundown. Call the meeting anything you wish: The content of the meeting is all.

Stanley M. Aronson, MD

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A Practical Approach to Hyperamylasemia

Edward R. Feller, MD

Which patient has pancreatitis?

Patient A is a 50-year-old alcoholic with a 1 day history of severe band-like upper abdominal pain. Serum amylase is 1000.

Patient B is a 50-year-old alcoholic with a 1 day history of severe band-like upper abdominal pain. Serum amylase is 50.

The correct answer is either patient, both, or neither. Measurement of the total serum amylase activity in serum is the key to the laboratory diagnosis of pancreatic inflammatory disease. Nonetheless, assessment of hyperamylasemia and an appropriate approach to pancreatitis requires understanding that an elevated serum amylase is due, commonly, to a non-pancreatic cause or decreased metabolic clearance of amylase. Furthermore, multiple potential causes exist for an unequivocally normal serum amylase level in the presence of unequivocal pancreatitis.

... determination of a serum lipase to serum amylase ratio may differentiate alcoholic pancreatitis from other etiologies.

Many organs contain enzyme with activity reflected in a standard serum amylase assay. Amylase in serum represents the sum of contributions of a variety of amylase isoenzymes (or isoamylases) of pancreatic and non-pancreatic origin, especially salivary glands.¹ Various methods, including gel electrophoresis and isoelectric focusing distinguish amylases from different tissues. One of these isoamylases disappears after total pancreatectomy and is increased in acute pancreatitis. Other isoamylases are elevated in salivary gland disorders and a variety of other diseases. Although acute or chronic pancreatitis may be the most common explanation for hyperamylasemia, a

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diverse range of other illnesses, some with clinical features identical to those of acute pancreatitis, are also associated with an increase in the serum amylase (Table 1).

Serum Amylase in Health and in Disease

Amylase is low in infancy, reaching adult levels by puberty. Enzyme activity is not affected by food ingestion, including alcohol. No difference in serum activity exists between men and women. Of potential clinical relevance is the finding that smokers may have basal serum amylase levels twice those of non-smokers.² Hemodialysis does not remove amylase, but nephrectomized patients have average serum levels 50% above normal. In one series, serum amylase was increased in 35 of 43 patients with chronic renal failure, but was greater than three times the upper limit of normal in only 3 cases.³ Thus, renal clearance is an important regulator of blood levels if one assumes that amylase enters serum at a normal rate in these individuals. Total serum amylase represents the sum pancreatic-type and salivary-type isoamylases from various origins.

Mechanisms of hyperamylasemia include:³ fortuitous association with another disease causing hyperamylasemia, pancreatitis or parotitis, decreased metabolic clearance of amylase, or amylase released from the involved organ. When pancreatitis is present, increased serum levels may be due to passage of amylase into pancreatic venous blood from the inflamed gland, passage into lymphatics and then into venous blood, leakage of enzymes from the pancreas or duct disruption with eventual absorption of enzymes from the peritoneal cavity and peripancreatic tissues. Patients with chronic, unexplained serum amylase elevations without abdominal complaints frequently have macroamylasemia.⁴ In this condition, normal serum amylase is bound to an abnormal protein, forming a complex with a molecular weight too large for normal glomerular filtration. These individuals have a normal or decreased urinary amylase, an elevated serum level, and can be detected by isoamylase studies of serum.

Although acute or chronic pancreatitis may be the most common explanation for hyperamylasemia, a diverse range of other illnesses, some with clinical features identical to those of acute pancreatitis, are also associated with an increase in the serum amylase.

Serum Amylase and the Alcoholic

Hyperamylasemia in alcoholic patients is attributed reflexively to pancreatitis by some physicians.^{5,6} Misdiagnosis and potential therapeutic misadventure may result if one ignores the multiple potential causes of an elevated serum amylase level in this setting (Table 2). Salivary hyperamylasemia is common, reflecting direct salivary gland damage due to ethanol. However, salivary isoamylase elevations in alcoholics rarely exceed three times the upper limit of nor-

Table 1.—Conditions Associated with Hyperamylasemia

Acute pancreatitis
Acute cholecystitis
Perforated peptic ulcer
Mesenteric infarction
Intestinal obstruction or perforation
Pancreatic pseudocyst, abscess
Pancreatic carcinoma
Pancreatic trauma
Post-ERCP
Laparotomy
Salivary disease
Uremia
Fulminant hepatic failure
Metabolic acidosis
Tumor hyperamylasemia
Ovarian carcinoma
Tubo-ovarian abscess
Ruptured ectopic pregnancy
Anorexia nervosa
Bulimia

mal, a finding that may be useful in differential diagnosis. Biliary disease and the possibility of gallstone pancreatitis are more common in alcoholics than non-drinkers. Ethanol can induce hemolysis that increases unconjugated bilirubin in bile as a nidus for stones. In addition, alcoholic liver disease may be associated with impaired hepatic synthesis of bile acids, resulting in lithogenic bile. A common problem in chron-

ABBREVIATIONS USED

CT: computed tomography
ERCP: endoscopic retrograde cholangiopancreatography

Table 2.—Be wary of the alcoholic with hyperamylasemia

1. Direct salivary gland toxicity of alcohol may produce salivary hyperamylasemia.
2. Alcoholics have an increased risk of gallstones, due both to ethanol-induced hemolysis and decreased hepatic bile acid synthesis.
3. Complications (eg, pseudocyst) can mimic acute inflammation.
4. Chronic alcoholic pancreatitis is associated with an increased risk of pancreatic carcinoma.
5. Perforated ulcer, mesenteric infarction, etc. can be mistaken for "pancreatitis"

ic alcoholic pancreatitis is a complication (pseudocyst, pancreatic abscess) that may mimic acute inflammation clinically and may produce increased serum amylase. Pancreatic carcinoma, a ductal tumor, is more common in drinkers and can cause pancreatitis due to ductal obstruction. Perhaps the most important warning when faced with an alcoholic with abdominal pain and hyperamylasemia is the knowledge that other, non-pancreatic disorders including mesenteric ischemia or perforated ulcer can occur in anyone and simulate the clinical and laboratory findings of pancreatitis.

Total serum amylase represents the sum of pancreatic-type and salivary-type isoamylases from various origins.

The appropriate approach to the alcoholic with abdominal pain and hyperamylasemia is to exclude a complication, evaluate the possibility of pancreatic carcinoma, and investigate whether an alternative intra-abdominal cause of hyperamylasemia exists. Computerized scanning (CT) is vital to visualize the pancreas, exclude fluid collections, and assess other abdominal organs for other pathologic processes.⁷ In the face of an acute abdomen, a normal CT scan is incompatible with severe pancreatitis and should prompt a search for another intra-abdominal catastrophe. Isoamylase studies will exclude a salivary-type increase as well as macroamylasemia.⁸ Serum lipase determination may be useful in diagnosis. Recent evidence⁹ suggests that determination of a serum lipase to serum amylase ratio may differentiate alcoholic pancreatitis from other etiologies. In a cohort of 446 patients, only those with alcoholic pancreatitis had a lipase to amylase ratio greater than 5 (sensitivity 31%, specificity 100%).

Acute Pancreatitis and Normal Serum Amylase

Pancreatitis can occur without elevated serum amylase values (Table 3). In a consecutive series of 352 attacks of acute pancreatitis documented by contrast-enhanced CT scan, 67 (19%) had normal serum amylase on admission.⁶ An alcoholic etiology was most common, probably reflecting the fact that a "burned-out pancreas from chronic ethanol excess may no longer be able to produce amylase, but may still become acutely inflamed. Another major factor was unappreciation of the fact that amylase release in serum in pancreatitis is transient, usually lasting only 48 to 72 hours. An initially abnormal level may return to normal before hospital admission or testing. In this study, subjects with a normal amylase had a significantly longer duration of symptoms than did those with elevated serum levels. Mild attacks may also have rapid resolution enzyme elevations.¹⁰ A rarer cause is hypertriglyceridemic pancreatitis with lactescent serum causing false-negative results unless serial dilutions are performed. The rare patient with a normal serum amylase and massive pancreatic necrosis may reflect inability of the necrotic gland to secrete sufficient amylase to maintain an elevated serum level.³ Determination of serum lipase, which rises after amylase and remains elevated longer, was useful in this study to confirm the diagnosis of pancreatitis.

Conclusion: An Approach to Hyperamylasemia

An elevated serum amylase remains the key to the diagnosis of acute pancreatitis. More importantly, recognition that the serum amylase level reflects contributions

from multiple tissues is vital to avoid diagnostic and management errors. The clinician, faced with a patient with abdominal pain and hyperamylasemia, must assess the possibility of a variety of non-pancreatic disorders as well as consider potential causes of acute pancreatitis and its complications. Knowledge of the range of conditions associated with this clinical and biochemical setting will guide evaluation and therapy. Determination of serum lipase and amylase isoenzymes may be instrumental in evaluating these patients. Use of CT scanning may confirm pancreatic inflammation, serve as a baseline for follow-up studies, assess prognosis, or direct management efforts to other organs. It is an exaggeration to state that an elevated serum amylase is no more specific than an elevated sedimentation rate. Clinicians must also be wary of the exaggeration of the deeply ingrained belief that hyperamylasemia always reflects pancreatic inflammation.

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Table 3.—Acute pancreatitis and normal serum amylase

1. The pancreas, especially in alcoholics, may be "burned out" and unable to produce amylase despite inflammation.
2. An initially elevated amylase may have returned to normal before testing.
3. The severely necrotic pancreas may be unable to secrete adequate amounts of amylase to maintain an elevated serum level.
4. A serum inhibitor (eg, hypertriglyceridemia) may interfere with laboratory determination of amylase.

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Biliary Scintigraphy in the Diagnosis of Acute Cholecystitis: A Review of 100 Cases

Melissa Frisch, MD ('94), Charis Meng, MD ('94), Robert Wolek, MD ('94), Douglas DeOrchis, MD, Edward R. Feller, MD

About 500,000 cholecystectomies are performed annually in the US, costing more than \$1 billion. In many patients, surgery is clearly indicated; no difficulty is encountered in the patient with typical clinical manifestations of acute cholecystitis in whom abdominal ultrasonography (US) demonstrates gallstones.

A frequent dilemma exists, however, in determining the appropriate approach to the patient with typical abdominal pain and a normal or non-diagnostic US or the case with atypical pain and gallstones seen on US imaging. In the former situation, acute cholecystitis may be present but the US fails to visualize the presence of small stones, sludge, crystals, or because of technical difficulties. In the latter case, stones may be present, but are unassociated with any symptoms and thus not incriminated in the episode of pain.

Since the development of biliary scintigraphy using technetium-99m-labeled derivatives of iminodiacetic acid (HIDA), a new era in biliary diagnosis has begun. These gamma-emitting compounds are rapidly taken up by the liver and excreted in bile. If the cystic duct is patent, the gallbladder is visualized. If the cystic duct is obstructed or in spasm, as in acute cholecystitis, the HIDA scan shows flow into the common bile duct and duodenum without gallbladder visualization.¹

Ultrasound is usually the best initial test for the detection of acute or chronic cholecystitis because of its accuracy in detecting stones as well as the information it provides about other intra-abdominal organs. In some

cases, however, the diagnosis of possible acute cholecystitis is elusive. To define the role of hepatobiliary imaging in possible acute cholecystitis, we reviewed 100 consecutive HIDA studies. We report this series to alert clinicians to the utility and limitations of biliary scintigraphy in the evaluation of unexplained upper abdominal pain of possible gallbladder origin.

Table 1.—Biliary scintigraphy results for patients with known clinical and pathologic diagnoses

Clinical Diagnosis	HIDA test results (n=100)	
	positive	negative
positive	13	2
negative	7	78

Patients and Methods

We reviewed retrospectively 100 consecutive hepatobiliary (HIDA) scans done in 1991-1993 at The Miriam Hospital, a Brown University-affiliated general medical-surgical hospital. All studies were done using accepted methods during an acute episode of pain, usually within 24 hours of admission. Only patients whose scans were requested for evaluation or possible acute cholecystitis were reviewed. No patients were included whose studies were performed for chronic pain without an acute episode or for demonstration of a possible post-operative bile leak.

Visualization of the gallbladder within 4 hours was interpreted as a negative study for acute cholecystitis. Nonvisualization of the gallbladder after 4 hours was considered to be consistent with acute cholecystitis. In each case, medical records, including operative and pathologic reports, were reviewed when available to determine the presence or absence of acute cholecystitis. In unoperated patients, HIDA results were correlated with clinical course, including any further admissions for abdominal complaints.

Results

Of the 100 consecutive patients having HIDA scans for possible acute cholecysti-

The principle behind nuclear medicine imaging of the biliary tract rests, not on the presence or absence of gallstones, but rather on whether acute inflammation and cystic duct obstruction are present.

tis, 40 had subsequent surgery with pathologic reports, while 60 were correlated with clinical outcome (Table 1). Of 20 patients with positive studies, 13 were true positives, while 7 were false positives. Of those with negative studies, 78 were true negatives and 2 were false negatives. The overall sensitivity and specificity of biliary scintigraphy were 87% and 92%, respectively. The predictive value of a positive test in this population was 65%, and the predictive value of a negative test was 98%.

Of the 40 patients having macroscopic and histologic confirmation of the diagnosis, 13 were true positives, 7 were false positives, 18 were true negatives, and 2 were false negatives (Table 2). For this group, the sensitivity and specificity were 87% and 72%, respectively, while the positive and negative predictive values were 65% and 90%, respectively (Table 3).

Table 2.—Biliary scintigraphy results for patients with pathologic diagnosis

Pathologic Diagnosis	HIDA test results (n=40)	
	positive	negative
positive	13	2
negative	7	18

Discussion

Ultrasonography (US) is the most common test to evaluate possible acute or chronic cholecystitis and has a diagnostic accuracy of 90% to 98% in detecting cholelithiasis.² The presence of gallstones by US in a healthy patient with fever, a moderately elevated white blood cell count, and right upper quadrant tenderness is sufficient evidence for a diagnosis of acute cholecystitis.³ False positive results are rare, but negative studies can occur when small stones, sludge, or crystals are responsible for symptoms. In the acutely ill patient, ileus and an air-distended abdomen may limit sonographic

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ABBREVIATIONS USED

HIDA: Iminodiacetic acid
US: Ultrasonography

Table 3.—Sensitivity and Specificity Rates of HIDA Scans for Acute Cholecystitis

	Patients with clinical correlation (n=100)	Patients with pathology report (n=40)
Sensitivity (%)	87	87
Specificity (%)	92	72
Positive Predictive Value (%)	65	65
Negative Predictive Value (%)	98	90

imaging of the gallbladder. In addition, many patients have silent stones that, though present, are not responsible for clinical disease. Compelling evidence exists to suggest that the natural history of asymptomatic gallstones frequently does not warrant intervention.⁴

The principle behind nuclear medicine imaging of the biliary tract rests not on the presence or absence of gallstones, but rather on whether acute inflammation and cystic duct obstruction are present. Published reports indicate that HIDA scans have a sensitivity and specificity of greater than 95% if the full 4-hour testing is performed (Table 4).⁵⁻⁷ Accuracy decreases to 80-85% if only 1 hour of testing is done. Several conditions, including prolonged fasting, recent heavy food intake, alcoholism, parenteral nutrition, carcinoma of the gallbladder, acute pancreatitis, and severe illness can cause false positive studies.⁴

Ultrasound is usually the best initial test for the detection of acute or chronic cholecystitis because of its accuracy in detecting stones as well as the information it provides about other intra-abdominal organs.

We could find no consistent pattern of associated disorders to account for our disturbingly high number of false positive results. Some patients, however, may have had a relatively atonic, poorly contracting gallbladder due to fasting or other local inflammatory processes, accounting for normal gallbladders that did not visualize. False negative HIDA scans are rare and have been attributed to anatomic abnormalities including an accessory cystic duct, a duodenal diverticulum simulating the gallbladder as well as acalculous cholecystitis.³ The most common and clinically important reason for a normal HIDA in the presence of acute cholecystitis and associated cystic duct obstruction or spasm is delay in performing the test. It is vital to underscore the time-dependency of biliary scintigraphy. Studies performed after pain has subsided for more than 24 hours have a higher false negative rate than promptly performed scans. Mild

disease may also be associated with only transient cystic duct obstruction not demonstrated on a scan delayed more than 1 day after an attack of pain.

Review of our data revealed several methodologic problems that may influence results. In our study population, biliary scans were ordered at the discretion of the physician, not selected randomly or by a defined protocol. Thus, our study population may represent a spectrum of patients different from that seen in other clinical settings. Another inherent difficulty is that evaluation of the accuracy of any diagnostic test depends on its relationship to some gold standard of accuracy that reliably distinguishes between those patients having the disease in question and those not having the disease. Thus, it is impossible to determine the actual false negative rate in unoperated patients since clinical follow-up is insufficient to determine the presence or absence of acute cholecystitis. Another potential source of bias concerns the time dependency of HIDA results. In our study, as in actual clinical practice, biliary scintigraphy done earlier or later during disease might have generated different individual test results. A further concern is the difficulty, in a retrospective study, of determining the actual clinical utility of HIDA scanning in influencing clinical decisions; in some of our patients, HIDA scanning was performed in patients with a high clinical suspicion of gallbladder disease and cholelithiasis demonstrated on ultrasonography. Thus, we could not assess reliably the clinical impact of HIDA on decision-making in each case.

Our results suggest that biliary scanning is useful in detecting acute cholecystitis and cystic duct obstruction or spasm. At times, the knowledge of whether a patient simply has gallstones is not the important clinical

question.⁸ In the patient with known gallstones suspected of having an alternative diagnosis to explain an episode of pain, a biliary scintigraphic study done during the episode which shows a patent cystic duct, excludes acute cholecystitis and may prevent unnecessary surgery for asymptomatic gallstones. False positive results are a problem that may be reduced by routinely giving patients intravenous cholecystokinin to empty the gallbladder before administering the radioisotope.³ Positive HIDA scans should be interpreted with caution in patients with severe, acute illness and after prolonged fasting. When clinical suspicion of cholecystitis is high and US is non-diagnostic, a positive HIDA scan (ie, demonstrating no gallbladder filling at 4 hours) is strong evidence of acute cholecystitis. Understanding the complementary role of US and biliary scintigraphy will allow the clinician to maximize usage of these tests in the diagnosis of gallbladder disease.

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Table 4.—Comparison of Sensitivity and Specificity of HIDA Scans for Acute Cholecystitis in National Literature and Miriam Hospital

Study	Sensitivity	Specificity
Klingensmith, et al (1990)	97%	66%
Grossman, et al (1991)		
4-hour testing	>95%	>95%
1-hour testing	80-88%	80-88%
Carballo, et al (1992)	96%	88%
Miriam Hospital (1993)	87%	72-92%

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Gallstone Pancreatitis: Mechanisms and Management

Nicholas A. Califano, MD

In the United States, alcohol accounts for 60% to 70% of cases of acute pancreatitis, while gallstones are the cause in about 30%. Evidence suggests that the initiating event causing pancreatitis associated with gallstones is a transient obstruction at the ampulla of Vater by a gallstone migrating down the common bile duct. In a classic study, Acosta and Ledesma found stones in the feces of 88% of patients with gallstones and pancreatitis within 10 days of an attack, but in only 11% of patients with gallstones without clinical pancreatitis.¹ In each case of pancreatitis, the stones recovered in the stools were identical in composition to those found in the gallbladder or common bile duct at subsequent laparotomy.

Table 1.—Factors associated with gallstone pancreatitis

- Large numbers of gallstones
- Small gallstones
- Large diameter cystic or common duct
- High basal sphincter of Oddi pressure
- High amplitude sphincteric phasic waves
- Common pancreatobiliary channel

Certain individuals with gallstones have an increased risk of pancreatitis (Table 1).² In one study of 769 patients with cholelithiasis undergoing cholecystectomy, patients with pancreatitis had significantly smaller stones as well as a greater number of residual biliary stones than those without pancreatitis.^{3,4} Others have underscored the importance of microlithiasis (stones less than 2 mm in diameter), sludge, or crystals in patients with "idiopathic" pancreatitis. Recently, Ros et al found that 73% of a group of patients with unexplained pancreatitis had biliary sludge or microlithiasis in aspirates of duodenal bile.⁵ Treatment of such stone disease by chemical dissolution with urso deoxycholic acid or cholecystectomy prevents recurrent attacks in many patients. Other risk factors implicated in an increased incidence of biliary pancreatitis include large diameter of the cystic duct or common bile duct, the presence of a com-

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mon pancreaticobiliary channel at the ampulla of Vater, and motility disturbances including high basal sphincter of Oddi pressure or high amplitude phasic sphincteric waves. The latter motility abnormalities may increase the possibility of migrating stones being trapped at the ampulla.

Pathogenesis of Gallstone Pancreatitis

Although a migrating gallstone triggers the events leading to biliary pancreatitis, the exact mechanism is speculative. Several theories have been advanced to explain the pathogenesis of pancreatic inflammation due to gallstones:

1. Opie first proposed the Common Channel Theory that suggested that pancreatitis occurred because the distal common bile duct and the pancreatic duct shared a common channel. Impaction or blockage of this channel by a stone causes reflux of bile into the pancreatic duct that may lead to activation of pancreatic enzymes. Reber and others have demonstrated that bile salts can damage the pancreatic duct mucosal barrier.⁶ This injury could allow macromolecules as large as those of digestive enzymes to diffuse across the duct into the pancreatic parenchyma, thereby causing inflammation to occur.

Numerous objections to this classic theory have been advanced. Only a minority of patients have a common channel of sufficient length to allow stone impaction or injury. In addition, pancreatic duct pressure exceeds biliary duct pressure; thus, obstruction of a common channel should favor flow of pancreatic juice into the biliary tract and not the reverse. Furthermore, surgically created anastomoses between the pancreas and the digestive tract do not appear to result in pancreatitis.

2. A second postulated mechanism, the Duodenal Reflux Theory, suggests that duodenal contents reflux across an incompetent sphincter of Oddi, flowing into the pancreatic duct where pancreatic enzymes may be activated by duodenal enterokinase. However, pancreatitis is not produced after surgical procedures that destroy or open the sphincter of Oddi. Thus, this theory has fallen into disfavor.

3. The most widely accepted mechanism is the Pancreatic Duct Hypertension Theory that postulates an increased pressure in the

Acute gallstone pancreatitis is caused by a migrating gallstone obstructing the ampulla of Vater.

pancreatic duct resulting from continued secretion of pancreatic juice distal to the obstructed duct. This ductal hypertension may cause rupture of peripheral ductules, extravasation of pancreatic juice into the parenchyma and subsequent intrapancreatic activation of enzymes. Recent evidence suggests that intracellular activation of pancreatic enzymes by lysosomal enzymes occurs at the level of the luminal membrane of the acinar cell.⁷

Table 2.—Biochemical parameters predicting gallstone etiology of pancreatitis.

Test	Score
Alkaline phosphatase >95 IU/L	1
GGTP >12 IU/L	1
ALT >60 IU/L	1
Bilirubin >1.6 mg/dl	1
ALT/AST	1
Total	5

GGTP: gamma glutamyl transpeptidase

ALT: alanine aminotransferase

AST: aspartate aminotransferase

* Score of > 3 is predictive¹⁶

Management of Biliary Pancreatitis

The general management of acute pancreatic inflammation is independent of underlying etiology. Since gallstone pancreatitis is clearly due to at least transient obstruction of the distal common bile duct by a migrating gallstone, definitive treatment includes removal of all stones remaining in the biliary tract. The majority of episodes of biliary pancreatitis are mild and improve with conservative management. Imaging studies (ultrasound, CT) may establish a diagnosis permitting elective surgery to remove any remaining calculi. Abundant data exists to support elective cholecystectomy at the end of the initial hospital

ABBREVIATIONS USED:

ALT: alanine aminotransferase

AST: aspartate aminotransferase

CT: computed tomography

ERCP: endoscopic retrograde cholangiopancreatography

ES: endoscopic sphincterotomy

GGTP: gamma glutamyl transpeptidase

IU/L: International units per liter

ization after resolution of pain and normalization of serum amylase.⁸ Delaying surgery for a later admission for elective cholecystectomy risks further attacks of pancreatitis or cholecystitis. Windsor et al reported that 15 of 28 patients (53%) developed recurrent pancreatitis while awaiting readmission for elective cholecystectomy with a median interval of only 27 days between attacks.⁹

Management is controversial in the 10% to 20% of patients with acute gallstone pancreatitis who have severe disease initially or subsequently deteriorate. In this group, it is essential to determine quickly whether gallstones are present and incriminated in producing symptoms. In acute, severe pancreatitis, data indicate that early surgery is associated with considerable morbidity and mortality. Ranson et al reported a 23% mortality in 22 patients operated on during the first week of pancreatitis; 4 of 6 patients with severe disease died.¹⁰ No deaths occurred in the 58 patients operated on after the first week of illness. In 1988, Kelly and Wagner performed a prospective, randomized trial of 165 patients with acute pancreatitis, comparing early (less than 48 hours after admission) vs late surgery (after 48 hours).¹¹ The groups were divided further into mild pancreatitis (3 or fewer of Ranson's criteria) or severe disease (more than 3 of Ranson's criteria). In mild disease, timing of surgery had no effect on outcome. However, in the group determined to have severe pancreatitis, early surgery was associated with morbidity in 82% vs 17% in the delayed group and an increase in mortality of 48% vs 12% compared to patients with severe pancreatitis having delayed surgery. These results suggest that, although a gallstone initiates an attack of pancreatitis, whether the episode progresses is decided early in the course and may not be affected by prompt surgical removal of an impacted stone (Table 2). Recent data indicate that endoscopic techniques may be effective early in severe pancreatitis to restore ampullary patency, establish biliary drainage, and improve outcome.

Endoscopic Retrograde Cholangiopancreatography (ERCP) and Endoscopic Sphincterotomy (ES)

The rationale for early endoscopic sphincterotomy (ES) to cut ampullary fibers and remove common duct stones is the belief that rapid relief of biliary obstruction and restoration of ampullary patency and biliary drainage would be associated with clinical improvement and a less severe course of pancreatitis. This is the identical

Table 3.—Randomized trial of early vs delayed surgery

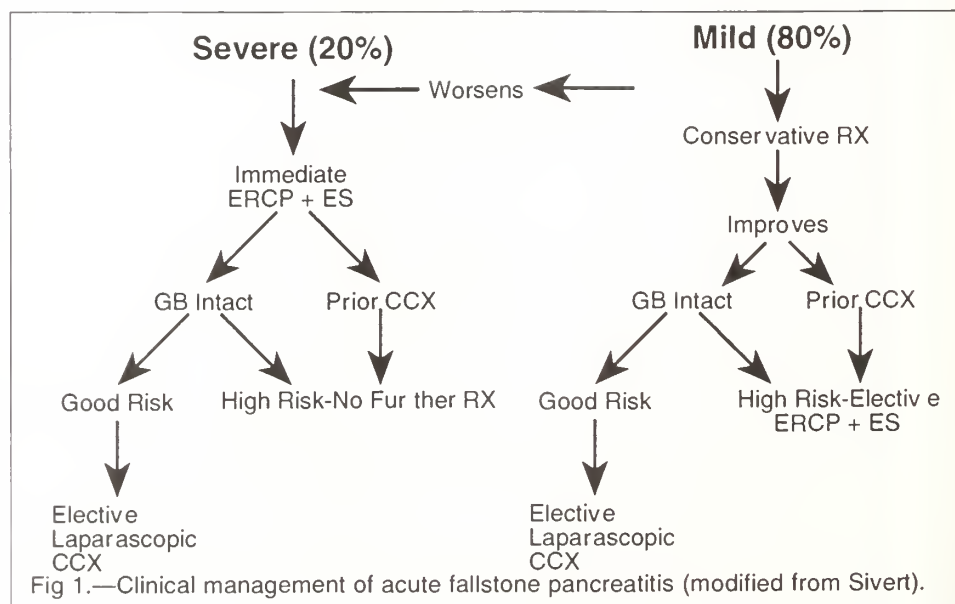
	Early Surgery	Delayed Surgery
Mild Pancreatitis (<3 Ranson signs)		
No. of Patients	73	79
Morbidity (%)	7	3
Mortality (%)	3	0
Severe Pancreatitis (>3 Ranson signs)		
No. of Patients	27	21
Morbidity (%)	83	18*
Mortality (%)	48	12*

* $P < 0.25$ (modified from ref. 11)

rational advanced by advocates of early surgery, where results in severe pancreatitis have been disappointing. However, endoscopic and surgical intervention may differ in substantive ways. Laparotomy requires general anesthesia with risks related to anesthesia as well as the extent of the operative procedure. Increasing risk may be related to increasing age and associated comorbid conditions such as cardiac disease, azotemia or diabetes, particularly when sepsis, cholangitis, or respiratory distress is present.¹² ERCP and ES, however, require only conscious sedation without general anesthesia or laparotomy. Published data indicate that the complications of these endoscopic procedures are predictable and do not increase with increasing age or comorbid illnesses.¹³

A role for early ERCP in acute pancreatitis would require that patients with an episode caused by gallstones could be identified and selected to undergo ERCP. In addition, this approach would have to be shown to improve outcome in gallstone pancreatitis. The determination of specific

etiology in acute pancreatitis may be difficult in a specific case. (See the paper by Feller in this issue for a detailed discussion.) Various criteria have been promulgated in an attempt to identify patients with likely biliary pancreatitis. McMahon and Pickford prospectively studied serum levels of bilirubin, AST, ALT, alkaline phosphatase and concluded that elevated ALT levels on the day of admission suggested gallstones as the cause of an episode of pancreatitis.¹⁴ Others have indicated, from results of multivariate analysis, that use of a combination of variables bilirubin, alkaline phosphatase, AST, ALT, age, and sex) allowed correct prediction of a biliary etiology with female sex, and age being predictors of gallstones.¹⁵ Wang studied 88 consecutive patients immediately after the onset of an acute attack.¹⁶ He determined that a biochemical scoring system using serum enzyme levels correctly predicted a biliary etiology in 85% of cases (Table 3). In patients with acute gallstone pancreatitis, data is accumulating to suggest a role for urgent endoscopic intervention to diagnose and treat biliary calculi. In 1988, Neoptolemos and colleagues presented the results of a 5-year prospective, randomized trial of ERCP and ES, involving 121 patients with presumed gallstone pancreatitis.¹³ The patients were randomized and stratified according to severity of attack to a group receiving ERCP or conventional therapy. In patients judged to have mild pancreatitis, no difference in outcome was observed. In contrast, in patients predicted to have severe pancreatitis, those having ERCP and subsequent ES had a significant decrease in complications compared to the group receiving conventional management. Complication rates (61%) and mortality (17.9%) in the conventionally treated group declined to 24% and 1.7%,



respectively, in the endoscopic group. A second randomized trial from Hong Kong reported a dramatic reduction in biliary sepsis (0 of 97 patients) in patients receiving emergency ERCP compared to 12 of 98 patients in a conventionally treated group.¹⁷ In this study, urgent interventional endoscopy was most useful in decreasing mortality in the sub-group with stones impacted in the ampulla or in the common bile duct.

The rationale for early endoscopic sphincterotomy to cut ampullary fibers and remove common duct stones is the belief that rapid relief of biliary obstruction and restoration of ampullary patency and biliary drainage would be associated with clinical improvement.

These results suggest that urgent endoscopic sphincterotomy provides better emergency decompression of the biliary tree than does surgical intervention and may improve outcome. Adherents of this approach also point out that tiny, difficult-to-detect calculi or microliths, incriminated in many attacks of unexplained pancreatitis, are discovered only after endoscopic sphincterotomy is performed. Critics of urgent ERCP in pancreatitis suggest that most stones found in the bile duct early in an attack may eventually pass spontaneously; thus the added risk of diagnostic ERCP and possible therapeutic endoscopic sphincterotomy is unnecessary in many cases. Another criticism of early endoscopy is the absence of exact criteria to select patients with a high enough risk of calculi to justify ERCP early during acute pancreatic inflammation.

Primary Treatment by Endoscopic Sphincterotomy

Cholecystectomy is the standard and rational approach to treat calculi in the gallbladder. In a small group of high-risk patients, chemical dissolution of stones or extra-corporeal shock wave lithotripsy followed by continued chemical dissolution, may be appropriate. Does a role exist for endoscopic sphincterotomy for removal of common duct stones in patients with an intact gallbladder in whom no further treatment is planned? This procedure is logical in the emergency management of common duct stones in patients acutely ill with cholangitis or pancreatitis. Immediate biliary drainage is established and elective cholecystectomy can be performed subsequently with reduced risk. Some patients, however,

have shrunken gallbladders, frequently without stones or have operative risks that may lessen enthusiasm for further operative treatment. In this setting, ES has been used to clear the common bile duct of stones. Subsequent cholecystectomy is performed only when indicated for recurrent symptoms.

Endoscopic sphincterotomy decreases the lithogenicity of bile. Six to nine months following ES, patients with an intact gallbladder show a markedly reduced bile acid pool.² Experimentally, endoscopic sphincterotomy in dogs has been shown to enhance passage through the cystic duct of plastic balls surgically implanted in the gallbladder compared to passage in a group without prior sphincterotomy. Some stones have spontaneously cleared from the gallbladder following ES in patients studied by ultrasonography. Thus, ES may be a reasonable option for primary treatment of gallstone pancreatitis in patients considered to be at high risk for cholecystectomy.

Certain patients appear to be at increased

risk if the gallbladder is left *in situ* after ES. In a long-term study of 122 patients with common duct stones and intact gallbladders who underwent ES, acute cholecystitis did not develop in 91 patients without gallstones, whereas it did occur in 5 of 31 patients (16%) with gallstones.¹⁸ Another report of 75 patients with gallbladder left in place followed for 5 to 8 years after ES found that 13 patients (17%) were treated for acute cholecystitis.¹⁹ Of these, 12 required cholecystectomy. In reported series, calculi in the gallbladder at the time of initial treatment, along with nonvisualization of the gallbladder by retrograde cholangiography, define a subgroup in whom an increased risk of recurrent symptoms is present.

The policy of using ES as primary treatment for biliary calculi and reserving cholecystectomy for patients with stones remaining in the gallbladder or when symptoms develop has been used primarily in elderly, frail patients in whom additional surgery

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may be hazardous. This approach has not been advocated for healthy, younger patients and has not been tested in a randomized controlled trial. A further note should be made that some endoscopic enthusiasts are attempting to remove stones from the gallbladder, directly, using balloon catheters or baskets passed endoscopically through the cystic duct. A proposed scheme for the clinical management of patients with acute gallstone pancreatitis is shown in Figure 1.

Conclusion

Acute gallstone pancreatitis is caused by a migrating gallstone obstructing the ampulla of Vater. Most patients improve rapidly, but a small number progress to severe disease. Patients with severe disease and a high likelihood of biliary origin should undergo urgent ERCP and ES if common duct stones are found. After clinical improvement and during the same hospitalization, cholecystectomy should be performed, preferably by the laparoscopic technique. Patients who have had a prior cholecystectomy or have no residual calculi in the gallbladder are treated by sphincterotomy alone. High-risk patients with acute gallstone pancreatitis and intact gallbladders without stones may be adequately treated by ERCP with ES without subsequent cholecystectomy. Total management of acute biliary pancreatitis requires the close cooperation and expertise of internists, gastroenterologists, surgeons, and radiologists to achieve the best outcome. Management must be individualized for optimal results.

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Endoscopic Therapy of Acute and Chronic Pancreatitis

Neil Greenspan, MD

Endoscopic therapies to treat biliary stones or obstructive jaundice are established as valuable alternatives to surgery in a variety of biliary disorders.

Direct injection of dye into the biliary and pancreatic ducts via endoscopic techniques has become an important tool in the diagnosis of a wide range of clinical problems. Knowledge of ductal anatomy may be vital in diagnosing unexplained pain of possible pancreatic or biliary origin, assessment of unexplained pancreatitis, and evaluation of obstructive jaundice. Therapeutic biliary techniques to remove common bile duct stones, to relieve biliary obstruction by endoscopic stent placement or balloon dilatation are well established. In contrast, therapeutic endoscopy involving the pancreatic duct is new and not extensively tested, possibly because of fear of serious complications related to pancreatic manipulation.

New concepts in management of pancreatic inflammation and its complications, coupled with technologic advances in endoscopic equipment and capabilities, have fostered the development of a variety of new approaches for endoscopic treatment of acute and chronic pancreatitis (Table 1).¹ This review will focus on specific therapeutic interventions involving the pancreas and its ductal system in managing acute and chronic pancreatitis and their sequelae. (See Califano in this issue for a review of biliary duct interventions in pancreatitis.)

Role of Pancreatography in Unexplained Pancreatitis

When history, laboratory studies, and non-invasive studies (CT scan, ultrasound) do not diagnose the etiology of an attack of pancreatitis, ERCP has been used to document unsuspected biliary stones, stenosis of the ampulla of Vater, pancreatic duct anomalies, or evidence of chronic (alcoholic) pancreatitis or pancreatic adenocarcinoma blocking the pancreatic duct. Evidence indicates that 30% to 50% of cases of unexplained pancreatitis will have potentially remediable causes discovered at ERCP.² The majority of these will be due to unsuspected biliary disease. However, pancreatography is being used increasingly to document anatomic abnormalities of the

pancreatic ductal system potentially amenable to specific treatment. The utility of this technique is highlighted by the fact that endoscopic pancreatography is the only non-operative means to visualize routinely the pancreatic duct.

In unexplained pancreatitis, two kinds of evidence with practical management considerations are possible by endoscopic means. Underlying diagnosis may be determined if specific ductal changes indicative of alcoholic pancreatitis, pancreatic carcinoma, or familial pancreatitis are found. Furthermore, pancreatography may indicate a range of abnormalities amenable to specific endoscopic treatment.

Table 1.—Therapeutic Pancreatic Endoscopy

Dilatation of pancreatic duct strictures
Extraction of pancreatic duct stones
Endoscopic drainage of pancreatic pseudocysts
Pancreatic duct sphincterotomy for ampullary stenosis
Minor papilla sphincterotomy for pancreas divisum
Endoscopic stenting of ductal strictures

Pancreatic Duct Strictures

Non-malignant narrowing of the main pancreatic duct may occur at the ampulla of Vater (ampullary stenosis) or in the more distal duct due to chronic pancreatitis, usually secondary to alcohol. In the latter case, encroachment of parenchymal fibrosis and chronic inflammation are the likely cause of ductal narrowing. Repeated episodes of abdominal pain and pancreatitis may arise because of impaired drainage and increased pancreatic duct pressures. Surgical options have included pancreatic sphincteroplasty (in the case of ampullary stenosis), pancreatic resection, or pancreatojejunostomy.

Endoscopically, pancreatic duct strictures may be dilated using balloons or dilating catheters advanced through a stricture over a guide wire passed beyond the narrowed point. Long-term success in dilating strictures has also been reported in 72% to 100% of cases by stent placement across a stricture.^{3,4} Clinical improvement has been claimed in 80% of patients followed up to 9 months. In many such cases, endoscopic pancreatic duct sphincterotomy is done be-

fore dilation. Potential complications include death due to duodenal perforation after sphincterotomy, hemorrhage, pancreatitis, or stent migration into the duodenum. Stents may also migrate distally into the pancreatic duct, where endoscopic or surgical removal is required. A disconcerting aspect of pancreatic stenting is the report of *de novo* ductographic changes mimicking those of chronic pancreatitis after stent placement.^{5,6} Unresolved questions include whether pancreatic duct stents are a permanent treatment, the ideal length of time stents should be left *in situ*, optimal treatment of stent occlusion, and the place of endoscopic stenting compared to other treatment modalities.

Pancreatic Duct Stones

An early change in alcoholic pancreatitis may be alcohol-induced precipitation of proteinaceous material into pancreatic ducts. These protein deposits then coalesce with calcium to form stones. Increased intraductal pressure proximal to the duct obstruction may then be responsible for acute attacks of pain or exacerbation of chronic pain. Surgical decompression of obstructed pancreatic ducts may alleviate pain in chronic pancreatitis. Uncontrolled studies have been reported in small numbers of patients in whom endoscopic removal of pancreatic duct stones has resulted in "clinical improvement" in the majority of patients.^{7,8} However, estimates suggest that only 20% of patients with chronic pancreatitis may be appropriate candidates. Factors associated with success and thus favoring an endoscopic approach to stone removal include:⁷ 1) three or fewer stones; 2) stones confined to the head or body of the pancreas; 3) absence of distal obstruction; 4) stone diameter of 10 mm or less; 5) absence of impacted stones; and 6) considerable expertise with therapeutic pancreatic endoscopy. Some patients have had combined procedures with extracorporeal shock-wave lithotripsy (ESWL) to fragment stones, followed by endoscopic sphincterotomy of the main pancreatic duct

ABBREVIATIONS USED:

CT: Computerized tomography
ERCP: Endoscopic retrograde cholangiopancreatography
ESWL: Extracorporeal shock-wave lithotripsy

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and removal by either basket or balloon.^{9,10} Randomized, controlled studies comparing different treatment options are lacking to place these modalities in perspective.

Pancreas Divisum

Pancreas divisum is a congenital anomaly caused by failure of fusion of the dorsal and ventral pancreatic buds during gestation. The result is that the major ventral duct, the duct of Wirsung, drains only a small portion of the head of the gland, while the bulk of the pancreas drains via the minor papilla through the duct of Santorini. The presumed pathogenesis of an increased risk of pancreatitis is inadequate drainage of pancreatic secretions through an anatomically normal, but functionally inadequate minor papilla. Procedures aimed at improving this drainage have been used in an attempt to decrease the incidence of pancreatitis. Modalities include surgical sphincteroplasty, minor papilla endoscopic sphincterotomy, and minor papilla stenting.

Only stent placement across the minor papilla has been studied in a small, prospective, randomized, controlled trial.¹¹ Nineteen patients with pancreatographically documented pancreas divisum and at least two prior episodes of pancreatitis were randomized to dorsal duct stent placement (n=10) or no treatment (n=9). During a mean follow-up period of 30 months, the stent group had significantly fewer hospitalizations or emergency room visits (0 vs 7, $P<0.05$) and fewer episodes of pancreatitis (1 vs 7, $P<0.05$). This series suggests that minor duct stenting may produce subjective and objective improvement in patients with pancreas divisum and recurrent pancreatitis.

Pancreatic Pseudocysts

A pseudocyst is a localized collection of extravasated pancreatic juice, enclosed by fibrous walls and adjacent viscera. Historically, pancreatic pseudocysts requiring treatment have been managed by surgical techniques. The traditional operative approach has been challenged in some clinical settings by interventional radiographic techniques employing percutaneous aspiration and drainage. Less experience exists in endoscopic management of pseudocysts. Despite the lack of controlled trials, various endoscopic means have been employed, including endoscopic cyst-gastrostomy or enterostomy. This method consists of using a diathermic needle to puncture the cyst wall under direct endoscopic vision through the gastric or duodenal lumen. The cystoenterostomy is then enlarged with a sphincterotome and drainage maintained through an enterocystic stent or nasocystic catheter.

Criteria for attempted endoscopic drainage include close approximation of the pseudocyst and the contiguous portion of the gastrointestinal tract, preferably with endoscopically visible extrinsic compression of the lumen by the pseudocyst.

In a recent review of more than 100 endoscopic cystoenterostomies, reported complications included bleeding, perforation, and infection, occurring in 12% of patients with a 1% mortality.¹ Cysts recurred in 15% of cases. A practical advantage of endoscopic treatment in this setting is the ability of endoscopic pancreatography to document duct obstruction by a pseudocyst or continued communication of the pseudocyst with the pancreatic duct, factors reported to be associated with cyst recurrence after percutaneous drainage. Although these results are promising, no long-term results have been published and no controlled trials exist comparing endoscopic management of pseudocysts with other currently accepted modalities.

Conclusions

Endoscopic therapies to treat biliary stones or obstructive jaundice are established as valuable alternatives to surgery in a variety of biliary disorders. Experience with endoscopic techniques to treat pancreatic inflammation and some of its sequelae is increasing. Long-term results, including comparison with other modalities, is lacking. Endoscopic management is relatively safe, technically feasible, and may have an expanding role in the therapeutic approach to pancreatic inflammation. These techniques may be especially appropriate in patients with acute and chronic pancreatitis and non-dilated ducts, in whom surgical resection rather than drainage may be the sole alternative.

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Pancreatic Cancer in 1994: Diagnosis and Treatment

Michael P. Vezeridis, MD

Harold J. Wanebo, MD

Carcinoma of the pancreas remains a frustrating problem for the clinician. The overwhelming majority of patients afflicted still die from the disease. At the time of the diagnosis, only a few patients are proper candidates for curative treatment, which clearly contributes to the dismal prognosis of this malignancy. An estimated 125 new cases of pancreatic cancer were diagnosed in Rhode Island in 1992 with 100 estimated deaths from the disease occurring during the same year.¹

Epidemiology and Etiology

An estimated 28,300 new pancreatic cancer cases occurred in the United States in 1992.² From the estimated 120,800 deaths from cancers of the digestive organs in 1992, pancreatic cancer has been projected to account for 25,000, approximately 21% of these deaths.² The peak incidence of pancreatic carcinoma is seen in the seventh decade with a slight male to female predominance and a higher incidence in blacks.^{3,4} There is some geographic variation in incidence with 2.2 new cases per 100,000 population in India, Kuwait and Singapore compared to 12.5 in Sweden. The differences, however, are not as dramatic as those observed for other cancers of the digestive tract.^{3,4} The incidence in most developed countries is similar to that of the United States with urban and socioeconomically disadvantaged populations being at higher risk for pancreatic cancer.³ Although the etiology of the disease remains unknown, several risk factors have been implicated. An association between cigarette smoking and pancreatic cancer has been established in many epidemiologic studies.⁵⁻¹¹ The risk of developing pancreatic cancer increases proportionately with the amount of cigarette smoking.^{5,12,13} Support for the epide-

miologic evidence is provided by experimental observations of pancreatic carcinoma induction in animals receiving tobacco-specific nitrosamines in drinking water.¹⁴ A relationship between meat and fat consumption and development of pancreatic carcinoma has been suggested by several epidemiologic studies.¹⁵⁻¹⁷ There is also experimental evidence that protein and fat in the diet are promoters of pancreatic carcinogenesis.^{18,19} The evidence regarding other dietary carcinogens such as coffee and alcohol in the etiology of pancreatic cancer is contradictory. Although an association between pancreatic cancer and coffee consumption was shown in one case control study,²⁰ other studies did not confirm this relationship.²¹⁻²³ The association between increased alcohol consumption and pancreatic cancer reported in one study²⁴ was also contradicted by others.²⁵⁻²⁷

Occupational exposure has also been implicated in the etiology of pancreatic cancer. Higher risk of pancreatic cancer has been observed in metal, mine, sawmill, chemical and coke plant workers.²⁸⁻³⁰ An increased risk has also been reported in workers exposed to solvents, petroleum compounds, betanaphthylamine and benzidine.^{26,31,32}

A higher risk of pancreatic cancer in patients with chronic familial pancreatitis exists, but not in patients with alcoholic pancreatitis.³³⁻³⁵ The correlation between diabetes and pancreatic cancer most likely reflects endocrine insufficiency as a result of neoplasia.^{36,37}

Pathology

The overwhelming majority of pancreatic cancers originate from the exocrine component of the pancreas and virtually all are malignant. Adenocarcinoma is the most common histologic type accounting for more than 80% of pancreatic cancers, while squamous carcinoma, carcinosarcoma, sarcoma and giant-cell carcinoma are rather uncommon.³ Most adenocarcinomas are of ductal origin^{38,39} and are located more frequently in the head of the pancreas. Multicentricity is quite common. In contrast to ductal carcinomas, acinar carcinomas are uncommon and are encountered most often in younger

Given the dismal outlook of pancreatic carcinoma, the development of innovative treatment approaches and the design of new, effective combinations of existing modalities is of paramount importance.

patients.³ Cystadenocarcinoma is an uncommon variety of pancreatic cancer, with a more favorable prognosis, arising from acinar cells.⁴⁰ Papillary pancreatic neoplasms are rare, occur usually in young females and manifest a low malignant potential.^{41,42}

The pattern of spread of pancreatic carcinoma has significant implications in the treatment. The vast majority of pancreatic cancers extend beyond the pancreas when diagnosed.³⁹ Direct invasion of adjacent anatomical structures such as the stomach, duodenum, major vessels, bile duct, colon, spleen and kidney is common and therefore may affect resectability. Early metastasis to regional and distant nodes is also frequently seen.^{39,43} Intraperitoneal dissemination with carcinomatosis and ascites and hematogenous metastases to the liver, lung, bones and brain are frequently encountered in the natural history of pancreatic cancer.^{3,4,39}

Clinical Presentation

Unfortunately, pancreatic cancer does not manifest early symptoms. Initial complaints are often nonspecific such as abdominal discomfort, abdominal pain, weight loss, anorexia and nausea.⁴⁴ Pain or jaundice are frequently presenting symptoms with pain usually preceding jaundice.^{3,45} Occasionally, migratory, superficial thrombophlebitis (Trousseau's syndrome) or unexplained pancreatitis may be the presenting symptom.^{3,46,47} New onset of diabetes may also be associated with pancreatic carcinoma. The most common physical signs of pancreatic carcinoma are jaundice, hepatomegaly, palpable gall bladder or abdominal mass and ascites.³

ABBREVIATIONS USED

CT: computed tomography
ERCP: endoscopic retrograde cholangiopancreatography
FUra: 5 Fluorouracil
IORT: intraoperative radiation therapy
LHRH: luteinizing hormone releasing hormone
MRI: magnetic resonance imaging
US: ultrasonography

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Diagnosis

Ultrasonography (US) and computed tomography (CT) are the imaging modalities most frequently used in the diagnosis of pancreatic cancer. Both modalities are useful in the detection of the primary tumor as well as extrapancreatic spread and hepatic metastases.^{51,52} Occasionally a pancreatic neoplasm can be found incidentally at an abdominal US study for other diseases.⁵⁵ The appearance of a pancreatic carcinoma in US examination is often that of a hypoechoic mass.^{56,57} Dilatation of the bile duct, gall bladder, intrahepatic biliary tree, pancreatic duct and invasion of the portal venous system by the tumor may be seen during US study.⁵⁸⁻⁶⁰ CT provides better delineation of the pancreatic tumor and the adjacent anatomic structures, is not operator dependent,⁶¹ and is the preferred diagnostic imaging modality for pancreatic carcinoma.^{53,61-63}

Magnetic resonance imaging (MRI), despite the advantages that it does not require intravenous contrast for the visualization of blood vessels and that post-operative studies are not affected by the presence of metal clips, has not proven to be as good as CT in the diagnosis of pancreatic cancer.^{3,64,65} Endoscopic retrograde cholangiopancreatography (ERCP) is useful in the differential diagnosis of tumors of the pancreas and the biliary tree and in the preoperative determination of resectability. In addition, ERCP may visualize tumors that, because of their location, obstruct the common bile and pancreatic ducts, but are not seen on CT scan, such as ampullary and duodenal carcinomas. These tumors can also be biopsied during ERCP, thus providing histologic confirmation of the diagnosis. Another advantage of ERCP is that it provides the opportunity to collect pancreatic fluid or brushing material for cytologic examination with a good diagnostic yield.⁶⁶⁻⁶⁸ Radiographic ERCP findings suggestive of pancreatic cancer are an abrupt, irregular cutoff, a stricture of the main pancreatic duct or an abrupt cutoff of both the main pancreatic and common bile ducts ("double duct" sign).³

Although many tumor markers have been considered for the diagnosis and follow-up of pancreatic cancer, no serum marker suitable for use in screening is available.^{4,69} CA 19-9 has been used widely, but is not specific for pancreatic cancer and is often normal in the early stages of the disease.^{4,70-72} CA 19-9 may be useful, however, for prognosis and follow-up of patients with pancreatic carcinoma.^{73,74} Carcinoembryonic antigen is of limited value in the diagnosis of pancreatic carcinoma because of low sensitivity and specificity.⁴ The ratio of testoster-

Reference	Total No. of Patients	Number of Patients with Pancreatic CA	Operative Mortality (%)	5-Year Survival for Pancreatic CA (%)
Grace et al ⁹⁷	96	37	8.3* (2% from 1980 to 1984)	3.0
Braash et al ⁹⁸	87	14	2.3 ^T	17.0
Crist et al ⁹⁹	88	50	12.5* (2% from 1980 to 1986)	18.0
Brooks et al ¹⁰⁰	48	48	8.3 (0% from 1977 to 1986)	14.0
Pellegrini et al ¹⁰¹	51	19	2.0 ^{TT}	33.0
Trede et al ¹⁰²	133	133	2.2 (0% from 1985 to 1989)	25.0
van Heerden ¹⁰³	190	190	6.8	6.3

* Figure includes benign and malignant disease.
T Figure includes all periampullary malignancies.
TT All patients underwent total pancreatectomy.

one to dihydrotestosterone is less sensitive, but more specific than CA 19-9 in the diagnosis of pancreatic cancer.⁷¹

Establishment of tissue diagnosis of pancreatic cancer may be difficult even at frozen section of biopsies taken during surgical exploration. Percutaneous biopsy of a pancreatic tumor can be performed using US or CT guidance.⁷⁵ In patients with unresectable or metastatic pancreatic cancer, percutaneous fine needle aspiration cytology is a safe and reliable approach with good sensitivity and capability of differentiating pancreatic adenocarcinomas from other tumors.^{4,75-79} Potential problems with fine needle aspiration biopsy include seeding along the needle tract and increase of intraperitoneal spread.⁸⁰⁻⁸³ Therefore, this diagnostic procedure should be avoided in patients with resectable pancreatic tumors.

The vast majority of pancreatic cancers extend beyond the pancreas when diagnosed.

Some new diagnostic techniques may prove valuable in the diagnosis and staging of pancreatic cancer. Radio-labeled monoclonal antibodies specific for pancreatic cancer may enable identification of small tumors.^{4,84,85} Endoscopic ultrasound was reported to be capable of detecting small pancreatic tumors and to be useful as a staging technique.⁸⁷⁻⁸⁹ Laparoscopy is very valuable in identifying small liver metastases, peritoneal and omental metastases.⁹⁰⁻⁹² Angiography is valuable in assessing invasion of major vascular structures and in defining the vascular anatomy which can have variations in up to one third of patients.^{93,94}

Treatment

Of all treatment modalities employed in the management of pancreatic cancer, only surgery has curative potential. Unfortunately, only a minority of patients with pancreatic cancer will be suitable candidates for pancreatic resection with curative intent mostly because the disease does not produce distinct symptomatology at the early stages. Subsequently, at the time of diagnosis, the vast majority of patients have locally advanced or disseminated disease.

Curative Surgery

Determination of resectability is a fundamental step in the surgical management of pancreatic cancer. If exploration reveals that the disease is limited to the pancreas, meticulous examination of the superior mesenteric and portal veins and the porta hepatis are of paramount importance in the assessment of resectability. Pancreatoduodenectomy is the standard operative approach for carcinoma of the head of the pancreas. It is a technically demanding procedure with significant potential for morbidity and mortality. A recent review of patients with pancreatic cancer operated on in a community hospital showed a mortality rate of 44%, raising the issue of whether or not pancreatic resections should be done by surgeons who perform this procedure occasionally.⁹⁵ The issue of the value of pancreatic resection as a curative modality has also been raised in the literature. In a review of 196 patients with pancreatic carcinoma, treated at Yale New Haven Hospital in a 10-year period, Gudjonsson found that the only 5-year survivor did not undergo a resection.⁹⁶ The same author, in reviewing the

literature of 50 years up to 1986, found that the overall 5-year survival was 0.4% with a 5-year survival of less than 4% for patients who had undergone resections. Based on these findings and the significant mortality and morbidity associated with the procedure, he concluded that the primary objective in treating patients with pancreatic cancer should be palliation.⁹⁷

Endoscopic retrograde cholangiopancreatography provides the opportunity to collect pancreatic fluid or brushing material for cytologic examination with a good diagnostic yield.

Several recently published series of pancreatic resections (Table 1) showed a significant decrease in operative mortality rate.⁹⁷⁻¹⁰³ In addition, some of these series demonstrated an improvement in survival with 5-year survival rates ranging from 14% to 33%.⁹⁸⁻¹⁰² Pancreatic resection for localized and resectable cancer, performed by surgeons experienced in major pancreatic surgery, is therefore justified.

The very limited role of surgery as curative treatment for carcinoma of the body and tail of the pancreas has been demonstrated by the fact that only isolated cases of long-term survival have been reported. In an extensive literature review, Jordan found only three patients surviving more than 5 years.¹⁰⁴ A recent study from the Mayo Clinic, however, showed a 15% 2-year and 8% 5-year survival among 26 patients who underwent distal pancreatectomy for ductal adenocarcinoma. The authors recommended resection of the distal pancreas for carcinoma of the body and tail of the pancreas when the disease is limited to the gland.¹⁰⁵ The fact that the mortality and morbidity of distal pancreatectomy were acceptable in this series (2% and 27% respectively) strengthens the rationale of resection for localized tumors.

Some surgeons advocated total pancreatectomy as the procedure of choice for pancreatic carcinoma. The main arguments for this surgical approach are the reported multicentricity of pancreatic carcinoma¹⁰⁶⁻¹⁰⁸ and the significant morbidity associated with pancreaticojejunal anastomosis. Despite early enthusiasm, however, total pancreatectomy has not been found to offer survival benefits.^{103,109} In addition, diabetes resulting from total pancreatectomy is brittle and difficult to manage, sometimes leading to death from hypoglycemia.¹¹⁰ Total pancreatectomy should, therefore, be reserved for patients with extensive involvement of the pancreas without spread beyond

the gland, for cases where intraoperative frozen-section study shows cancer near the margin, or for situations where a safe pancreaticoduodenal anastomosis cannot be performed.

Although more extensive surgical procedures such as regional pancreatectomy failed to improve survival in patients with pancreatic adenocarcinoma,¹¹¹ recent studies from Japan showed that the addition of regional lymphadenectomy and portal or superior mesenteric vein resection to pancreatectomy improved survival in certain patient groups,^{112,113} indicating that this approach may be applicable in selected patients with pancreatic cancer.

In recent years, the use of a less extensive surgical approach preserving the stomach and pylorus has been popularized in an effort to decrease the functional and nutritional sequelae of gastrectomy.^{97,98,115} Although some studies demonstrated no decrease in survival with the use of pylorus preserving pancreatoduodenectomy,^{98,115} others showed potential for survival compromise in some patients suggesting caution in the use of this approach.^{116,117}

Palliative Surgery

Since most patients with pancreatic carcinoma are not amenable to curative surgery, many patients will require surgical palliation usually for jaundice, gastric outlet obstruction and pain. Surgical decompression of the biliary tree as a biliary-enteric bypass is an effective means of palliation for jaundice. It also enables establishment of a definitive histologic diagnosis, accurate assessment of resectability and simultaneous performance of a gastrojejunostomy or a procedure for pain relief. Surgical biliary bypass, however, entails an operative mortality, as high as 18%^{118,119} and may not be a suitable approach for high-risk patients. In these patients, percutaneous or endoscopic placement of biliary stents provide good palliation with low mortality (1% to 2%),^{120,121} but significant complications include hemorrhage, bile leak, catheter malfunction and cholangitis. Subsequently, patients with biliary stenting have more frequent hospital readmissions than those with surgical bypass because of clogging of the endoprosthesis leading to recurrent jaundice or cholangitis.¹²²⁻¹²⁴

Duodenal obstruction is treated with surgical intervention. While in the presence of compression or invasion, the need for gastric bypass is obvious, the need for prophylactic gastrojejunostomy not having imminent obstruction is less clear. Based on collective review findings that 13% to 21% of patients undergoing biliary bypass only

require reoperation for duodenal obstruction, some authors feel that a prophylactic gastroenterostomy is safe and should be performed in patients who are expected to have longer survival.^{119,125} Others believe that prophylactic gastrojejunostomy is unnecessary because patients with duodenal impingement have high short-term mortality rate and also because the procedure provokes postoperative delayed gastric emptying due to an underlying motility disorder in these patients.^{126,127}

Severe abdominal and back pain occur frequently in patients with pancreatic cancer and can be incapacitating and difficult to control. Percutaneous or intraoperative chemoablation of the celiac plexus with alcohol injection provides significant pain relief in most cases.^{124,125,128,129} A recent report showed good results, with no procedure-related mortality and low specific morbidity in 51 patients with pancreatic cancer treated for intractable pain with transhiatal bilateral splanchnicotomy.¹³⁰

Radiation Therapy

Radiation therapy has been used in the management of pancreatic cancer both as an adjuvant following resection and for treatment of locally advanced, unresectable tumors. The limitations of this treatment modality are due to the anatomic relations to the pancreas that prohibit the delivery of tumoricidal doses of radiation.¹³¹ The concomitant administration of fluorouracil as radiation sensitizer appears to enhance the effect of radiation and improve survival in the adjuvant setting.^{132,133} Although there are no adequate data from controlled studies to evaluate the effect of radiotherapy on

Radiolabeled monoclonal antibodies specific for pancreatic cancer may enable identification of small tumors.

unresectable pancreatic cancer, it appears that the combination of radiation with FUra enhances local control.¹³⁴ The limitations of external beam radiation prompted the use of intraoperative radiation therapy (IORT), which is capable of delivering high doses of radiation to the pancreas without radiation injury to surrounding structures.¹³⁵ Combination of IORT with external beam radiation resulted in very good local control with median survival of 13 to 18 months.^{136,137} Despite the promising results reported from the United States^{136,137} and Japan¹³⁸ valid comparison of IORT to external beam radiation will require well designed prospective randomized studies of appropriate size.

Another method capable of delivering high doses of radiation to the pancreas without significantly affecting adjacent structures is implanting radioactive material such as iodine-125.^{139,140} Although good local control was obtained with the use of this approach,¹³⁹ it is associated with substantial operative mortality and morbidity.¹⁴¹

Overall, the data available in the literature indicate that radiation therapy is unsatisfactory as a curative treatment modality both as an adjuvant and in the management of locally advanced disease. As a palliative method, however, radiation may be useful by providing pain relief. Intraoperative radiation has also provided pain relief in a significant proportion of treated patients.^{137,142}

Chemotherapy

Chemotherapy is of limited value in the palliation of pancreatic cancer. Single agent chemotherapy with fluorouracil has given an overall response rate of 26%.¹⁴³ A similar response rate was observed with mitomycin-C in studies with a small number of patients.¹⁴⁴ Overall response rates in the 8% to 10% range were seen with doxorubicin,¹⁴⁵ streptozocin,¹⁴⁴ and ifosfamide.¹⁴⁶ Combination chemotherapy failed to show improved responses compared to single agent treatment except for one small prospective randomized multicenter study using fluorouracil, cyclophosphamide, methotrexate and vincristine. This showed a significant prolongation of survival with a median survival of 11 months in treated patients compared to 2 months in untreated patients receiving supportive care only.¹⁴⁷

Newer Approaches to Pancreatic Cancer

Recent interest in combining therapies for pancreatic cancer to improve survival has been expressed in the newer protocols proposed at research centers. Preoperative chemo-radiation therapy protocols have been tried at Fox Chase Cancer Center and MD Anderson Hospital with what appears to be promising results. The promise of improved tumor control appears to be heralded by dramatic antitumor responses, increased resectability, and tolerable toxicity with long term results to be observed. At our institution, we have instituted a protocol consisting of preoperative chemo-radiation and resection for locally advanced pancreatic cancer. Patients were explored and staged by biopsy and had biliary and gastric bypass, and then were given chemotherapy and radiation. Of the initial 13 patients who started the protocol, 9 came to surgery after

receiving chemo-radiation. Initially, 5 of the 9 patients were Stage 3. Eight were resected (5 required portal vein resection) and 1 had an interstitial implant in the head of the pancreas. Three of the 9 patients had no tumor specimen. There were 2 early deaths related to complications. The median survival of the resected group is 19 months.

Of all treatment modalities employed in the management of pancreatic cancer, only surgery has curative potential.

A new protocol has been initiated based on these early results. This emphasizes radiological and laparoscopic staging plus biliary bypass where possible, followed by external beam radiation (4000 cGy wide field, 1000 cGy reduced field) and chemotherapy (5 FU 300mg/ g/d x 5 continuous infusion weekly, plus Cisplatin 20 ng/ ²/d x 4 1st and 5th week of treatment). Patients are re-staged and explored with the plan to resect. If not resectable, completion of radiation 1500 cGy is given to the pancreas.

Other Treatments

Although pancreatic cancer is hormone-responsive in experimental animals,¹⁴⁸⁻¹⁵⁰ the role of hormonal therapy in the treatment of human pancreatic cancer has yet to be defined. In a recent British trial, patients with advanced pancreatic cancer were randomized into tamoxifen, cyproterone acetate or no treatment. The tamoxifen group had the longest survival of 23 weeks compared to 18 and 13 weeks in the other groups. These differences, however, were not statistically significant.¹⁵¹ No differences

in median survival were observed in another study comparing tamoxifen to placebo.¹⁵² Trials using luteinizing hormone releasing hormone (LHRH) and somatostatin analogs are currently in progress.¹⁵³

Other promising areas of recent investigation include photodynamic therapy,^{154,155} radioimmunotherapy,^{156,157} and modulation of fluorouracil with folic acid and alpha interferon.¹⁵⁸

Given the dismal outlook of pancreatic carcinoma, the development of innovative treatment approaches and the design of new effective combinations of existing modalities is of paramount importance. In a recent small study from Japan, an aggressive multidisciplinary treatment protocol combining extended pancreatic resection with 3000 cGy of intraoperative radiation and intraoperative hepatic arterial or portal infusion of 10mg of mitomycin-C resulted in an 86% 1-year survival without mortality or significant postoperative morbidity.¹⁵⁹

Although pancreatic cancer continues to be a formidable disease, numerous strategies are evolving that, it is hoped, will result in improved patient survival.

(A complete list of references is available in the editorial offices of RHODE ISLAND MEDICINE.—ED.)

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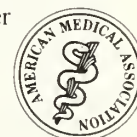
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OF SEASONAL
ALLERGIC RHINITIS

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- **Proven efficacy**

- **Nonsedating***

The incidence of sedation with CLARITIN Tablets (8%) was similar to that of placebo (6%) at the recommended dose.

- **Rapid-acting†**

CLARITIN Tablets started working in some patients in as soon as 30 minutes; 65% of patients experienced relief within 2 hours.†

- **Once-a-day dosing**

- **Low incidence of adverse effects**

In controlled clinical trials using the recommended dose, the incidence of headache (12%), somnolence (8%), fatigue (4%), and dry mouth (3%) with CLARITIN Tablets was similar to that of placebo (11%, 6%, 3%, and 2%, respectively).

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From Start To Finish**

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10 mg (loratadine)
TABLETS

* In studies with CLARITIN Tablets at doses 2 to 4 times higher than the recommended dose of 10 mg, a dose-related increase in the incidence of somnolence was observed.

† Relief began in 13% of treated patients vs 4% of placebo-treated patients within 30 minutes (P=.04). At 2 hours, 48% of patients receiving placebo experienced relief. Distribution of onset times was significantly earlier for CLARITIN Tablets vs placebo (P=.03).

Please see following page for brief summary of Prescribing Information.

CLARITIN[®]
brand of loratadine
TABLETS
Long-Acting Antihistamine

BRIEF SUMMARY
For full prescribing information, see package insert.

INDICATIONS AND USAGE

CLARITIN Tablets are indicated for the relief of nasal and ocular symptoms of seasonal allergic rhinitis.

CONTRAINDICATIONS

CLARITIN Tablets are contraindicated in patients who are hypersensitive to it and its ingredients.

PRECAUTIONS

General: Patients with liver impairment should be given a lower dose (5 mg) of CLARITIN Tablets.

Drug Interactions: The pharmacokinetics of a single 20 mg dose of CLARITIN Tablets were not significantly altered by a 200 mg dose of verapamil twice daily to 12 subjects resulting in increased plasma levels of loratadine and its active metabolite, desloratadine. A 50% increase in AUC was observed. However, the clinical significance of these findings is not known. No significant differences in clinical adverse events between CLARITIN Tablets and placebo were observed.

Other drugs known to inhibit hepatic metabolism should be administered with caution. The pharmacokinetics of CLARITIN Tablets may be altered by drugs that inhibit or induce hepatic metabolism. The pharmacokinetics of CLARITIN Tablets were not significantly altered by the administration of cimetidine, ranitidine, or ranitidine plus famotidine. The pharmacokinetics of CLARITIN Tablets were not significantly altered by the administration of cimetidine, ranitidine, or ranitidine plus famotidine. The pharmacokinetics of CLARITIN Tablets were not significantly altered by the administration of cimetidine, ranitidine, or ranitidine plus famotidine.

Carcinogenesis, Mutagenesis, and Impairment of Fertility: In 18-month rat carcinogenicity studies, the oral administration of loratadine at doses of 10, 30, and 100 mg/kg body weight for 18 months did not result in any significant changes in the incidence of tumors.

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YOHIMBINE HCl

Description: Yohimbine is a 3a-15a-20B-17a-hydroxy Yohimbine-16a-carboxylic acid methyl ester. The alkaloid is found in Rubiaceae and related trees. Also in Rauwolfia Serpentina (L) Benth. Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine. It is a crystalline powder, odorless. Each compressed tablet contains (1/12 gr.) 5.4 mg of Yohimbine Hydrochloride.

Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalamic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it, however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon[®] is indicated as a sympatholytic and mydriatic. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug. ^{1,2} Also dizziness, headache, skin flushing reported when used orally. ^{1,3}

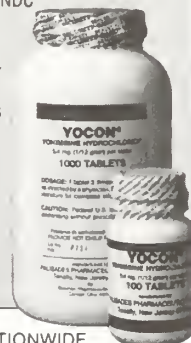
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence. ^{1,3,4} 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks. ³

How Supplied: Oral tablets of Yocon[®] 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

References:

1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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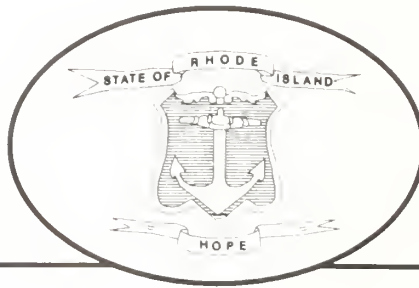
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1. Bedard P-M, Del Carpio J, Drouin MA, et al. Onset of action of loratadine and other efficacy variables in patients with seasonal allergic rhinitis. *Clin Ther.* 1992;14:268-275.

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HEALTH BY NUMBERS



Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Activity Reduction and Disability Among Persons with Diabetes

To assist in the development of a diabetes control plan, the Rhode Island Department of Health analyzed data from its 1990 statewide health interview survey to compare adults reported as having diabetes with other adults, focusing on activity reduction and disability.

Methods

Rhode Islanders in 3122 households were contacted by telephone in 1990, selected using random digit dialing in a geographically stratified sampling frame. Responses were obtained from 2588 households (83%). Information on demographics, health status, and behavior was obtained for 6536 household members, of whom 212 persons were reported to have diabetes. We successfully resurveyed 150 persons with diabetes (71%) in 1991 to obtain detailed information on diabetes care and disease status. Comparisons between adults with diabetes and other adults were made using 1990 data. Data from 1991 were used to explore differences in activity reduction and disability among persons with diabetes. Results were weighted to adjust for the stratified sampling design of the 1990 survey, and 95% confidence intervals (CI) were calculated to assess the precision of proportions.

Results

Thirteen percent (CI: 8%-18%) of adults with diabetes were found to be disabled permanently, versus 2% (CI: 1%-3%) of other adults (Figure 1). This difference persisted when age was controlled, appearing to be concentrated among persons ages 40-64. In this group 27% (CI: 15%-39%) of persons with diabetes were permanently disabled, versus 3% (CI: 2%-4%) of other persons (Figure 2). Among persons ages 40-64 those with diabetes were also more

likely (16%) than others (6%) to have stayed in bed more than half a day in the 2 weeks prior to being surveyed (Figure 3). Meaningful differences were not found between the two groups in temporary disability.

Discussion

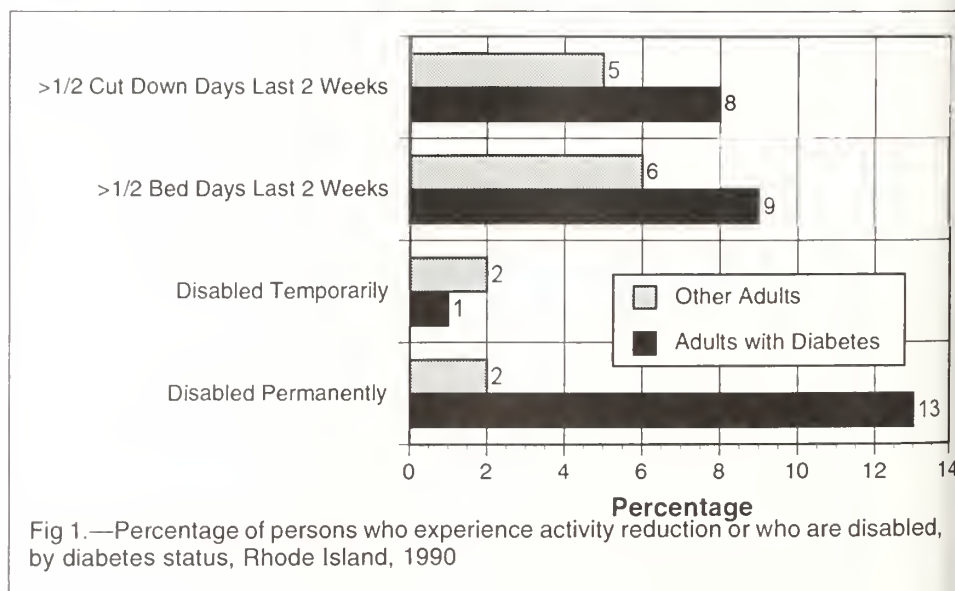
In 1990, from 8% to 18% of Rhode Island respondents with diabetes were permanently disabled. National findings are comparable; in 1989 about 20% of US respondents with diabetes were unable to perform their major activity.¹ The National Centers for Disease Control and Prevention estimate the annual cost of diabetes in Rhode Island to be over \$100 million. Much of this cost is attributable to medical care, but a substantial proportion is attributable to lost productivity from disability. According to national surveys, nearly two-thirds of respondents with diabetes attribute their activity limitation to the disease.¹

Diabetes control interventions seek to

maximize functioning among persons with diabetes. Strict adherence to national protocols² for glucose control, complications screening, patient education, and other aspects of care can reduce significantly the burden of activity reduction and disability from the disease. Guided by Year 2000 National Health Promotion and Disease Prevention Objectives,³ specific Year 2000 health outcome objectives have been defined in Rhode Island's diabetes control plan for decreasing activity reduction and disability by increasing adherence to protocols for diabetes care.

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2. Committee on Professional Practice. Position statement: standards of medical care for patients with diabetes mellitus. *Diabetes Care*. 1989;12:365-368.
3. *Healthy People 2000*. Washington, DC: US Department of Health and Human Services, Public Health Service; 1991. DHHS publication no. (PHS) 91-50212.



Submitted by Dona L. Goldman, BSN, MPH, John P. Fulton, PhD, Donald K. Perry, AB, Francis A. Donahue, MPA, Judith P. Feldman, MD, MPH, Division of Preventive Health Services. Health by Numbers is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.

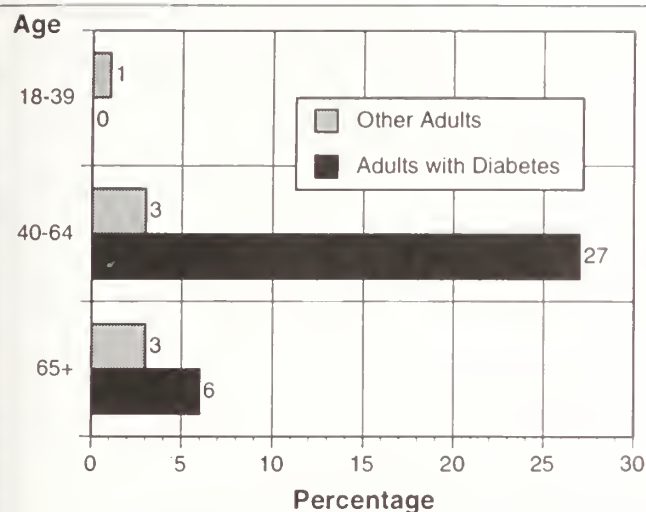


Fig 2.—Percentage of persons who are permanently disabled, by diabetes status and by age, Rhode Island, 1990

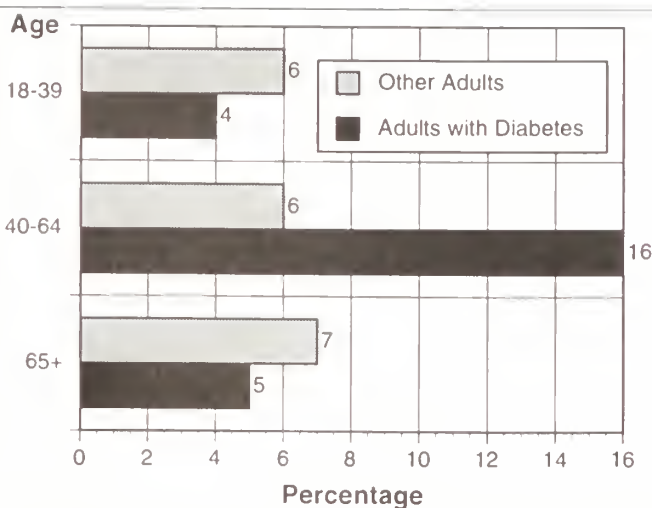


Fig 3.—Percentage of persons who stayed in bed more than one half day in the two weeks preceding the survey, by diabetes status and by age, Rhode Island, 1990

IMAGES AND PATTERNS IN MEDICINE

Edited by

Edward R. Feller, MD

A 65-year-old woman with previous episodes of upper abdominal pain is admitted with a 4-day history of intermittent nausea and vomiting. Initial abdominal X-rays were consistent with partial small bowel obstruction.

For interpretation and comment, see Page 125.



Next month in . . .

Rhode Island **MEDICINE**

Guillain-Barre Syndrome

Neurologic Deficits

in Cancer Patients

Hindu Medicine

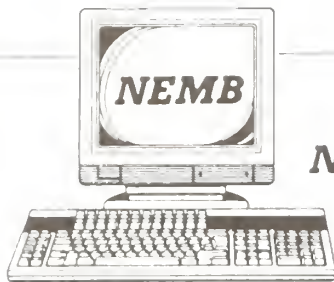
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THE RHODE ISLAND MEDICAL JOURNAL

The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

VOLUME 1
NUMBER 1

PROVIDENCE, R. I., JANUARY, 1917

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (April 1904)

John W. Keefe, MD, writes an article on nephrolithiasis. He observes that "Stone may be found in the interstitial, parenchymatous, or pelvic portion of the kidney. They may remain impacted or may be movable in the kidney.

They may pass into the ureter where they may become arrested, or may pass on into the bladder, where they may form the nucleus of a stone in the bladder; or they may pass through the urethra being voided with the urine. These calculi are found most frequently between the ages of 30 and 50 years and are found a little more frequently in the male." The author then illustrates his experience in this field by describing, in detail, two of his cases. The first, a 51-year-old female was troubled by recurrent flank pain. "Roentgen rays show a stone, probably in the left kidney." The ureters were catheterized. Scratch marks were visible on the waxed tips of the catheter suggesting the presence of a stone. Surgery resulted in removal of a stone "the size of a small olive." A second case, with pyonephrosis is also described.

George S. Mathews, MD, authors a paper on hypertrophic cirrhosis of the liver, sometimes called Hanot's cirrhosis. The hypertrophic form (in contrast to the atrophic form initially described by Morgagni and then Laennec) was first described in 1846 by Requin, followed by a succession of detailed analyses by, among others, Hanot. Its causation is obscure, but alcohol is not its cause. Some have suggested that this form of liver disease is perhaps bacterial in origin, with the infection arising from the small

intestine ascending through the common bile duct resulting first in a disseminated cholangitis. The disease seems more common in males and has been seen in children as well. At autopsy, the liver is customarily large (sometimes exceeding 10 pounds), is yellowish green in color and is hard, smooth and frequently showing a fine surface granularity. The author then describes the unilobular cirrhosis seen histologically. Two local cases of hypertrophic cirrhosis (both with confirmatory autopsy examination) are then described: the first, a 27-year-old male restaurant waiter; and the second, a 36-year-old brewer.

Harold G. Palmer, MD, writes a comprehensive article on gonorrhea offering a plea for systematic examination for the gonococcus in all cases of urethral inflammation. The author notes that urethral discharge has been recognized since antiquity (cf. Leviticus XV) long before the 1879 description of Gram-negative diplococci by Neisser. Palmer first discusses the cultural and staining characteristics of the gonococci followed by a brief summary of the pathologic lesions incited by this organism. After analyzing

the various clinical presentations of gonococcal infection, he concludes with a plea for more diligent appraisal of urethral inflammation. He observes: "The gonococcus is not a respecter of persons, and respectability renders no one immune. If my observations in the past are not incorrect, professional gentlemen, apprehensive of personal trouble, have hastened at the earliest manifestation of any urethral irritation to ascertain by microscopical examination if a gonococcus infection were present. Why should any physician not be equally solicitous for the welfare of his patient similarly afflicted?"

The Superintendent of Health, Charles V. Chapin, MD, offers a brief summary of the health of Providence. He notes that there were 319 deaths in December (1903) resulting in an annual death rate of 20.29 per thousand. During the past few months, he states, there has been a marked increase in scarlet fever as well as pneumonias unassociated with prior influenza. Diphtheria is also increasing in numbers. Chapin observes, "There were 10 diphtheria deaths in December and 8 in January. Perhaps some of these

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might have been prevented if the free distribution of anti-toxin had not been stopped on account of lack of funds."

50 Years Ago (April 1944)

The lead article describes the clinical presentation, diagnostic pitfalls and therapies for beriberi. Major Frank C. Cutts, MC, writing from an army base hospital in the China-Burma-India theater of operations describes 125 cases of acute beriberi, all in Chinese military personnel. While the hospital cares for Indian, American and Chinese military, cases of beriberi were confined to the Chinese units—and in particular one regiment with rice stores that were polished, spoiled and "devoid of any brown pericarp." Presenting complaints commonly consisted of shortness of breath on minimal exertion, swelling of the legs, arms and genitalia, and numbness of the legs associated with muscle pain when walking. Physical examination frequently disclosed engorged, pulsating neck veins, cardiac enlargement, sometimes with a gallop rhythm, occasionally a palpable liver edge and dependent edema. Treatment consisted of bed-rest and vitamin B-1 supplementation (au-

tolyzed yeast); with critically ill patients, thiamin chloride was given parenterally. Outcome in virtually all cases was good. Dyspnea disappeared rapidly, as did the cardiac dilatation. There was but one death in this series of 125. When the diet given to the Chinese regiments was modified, the weekly number of admissions for beriberi dropped from an average of 17 to but 1 per week.

Henry L.C. Weyler, MD, describes "small pin point to pin head areas on the uvula, soft palate, posterior pharyngeal wall and pillars in cases of acute respiratory infection (common colds, grippe, influenza, viral pneumonia.) These reflectile bodies, according to the author, remain from days to months after the acute phase has completed its course. No explanation of this reflectile phenomenon is offered. The author calls these reflectile bodies since they selectively reflect light.

The lead editorial notes that the Medical Society will shortly conduct its 133rd annual meeting. The editorialist notes with pride that some of the past papers presented were scientifically notable (eg, Dr Reginald Fitz' 1886 paper on appendicitis.) The editorial concludes: "One-hundred-and-thirty-two years ago, as the Society organized for its

first scientific assembly, nations of the world were embroiled in conflicts and Napoleon was experiencing his catastrophic retreat from Moscow. Again the nations are in martial conflict, and another would-be conqueror marches ingloriously out of Russia. Again the medical profession of Rhode Island stages its annual assembly in a world at war, to plan and prepare for greater expansion of the science of medicine in a happier and healthier tomorrow."

Another editorial pays homage to the 100th anniversary of the founding of Butler Hospital (on Richard Brown's Grotto Farm). The editorial notes the succession of successful physician-leaders of this institution beginning with Dr Isaac Ray and continuing through Drs Sawyer, Goldsmith, Gorton, Blumer, and Ruggles.

A special section of the Journal is devoted to news concerning "Doctors at War," the activities of Rhode Island physicians in various military outposts throughout the world.

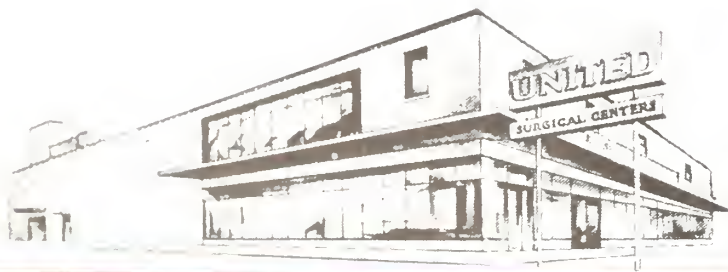
25 Years Ago (April 1969)

In a Journal issue devoted largely to social and medical problems in higher edu-

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cation, Dana L. Farnsworth, MD, discusses the question of college dropouts. Does it represent waste, failure, disruption? The author notes: "Our quite considerable dropout rate reflects a central fact about education. There is in America an assumption, generally overemphasized, that college is a positive good for most young people. It is time to call this belief into question. The so-called dropout problem is a misnomer. Those of us who are in education are involved in the problems of youth—learning, constructing an identity, and working effectively—and we must not be led astray by false issues."

Gilbert Houston, MD, a school physician in Warwick, writes on the medical and psychological problems of college students. The author discusses the role of change, experimentation, authority, communication and freedom in molding the maturing adolescent. He concludes: "One's main objective in this age group is to help individuals build values by which to live and standards by which to make important decisions that will affect their future years."

Roswell Johnson, MD, director of Health Services at Brown University, shares his views on the stressful transition made by the adolescent striving for maturity. He urges that adults not be deceived by hairstyle, facial hirsutism or outlandish clothing styles. "This generation of young people," says the author, "are saying to all of us that, if there is a good reason for a restriction or a law or a custom, the majority of them, with concern for their fellow man, will follow that restriction. They find it difficult to understand why there is on the statute books of the State of Rhode Island a law which provides that the giving of one marijuana cigarette to a friend can result in a minimum prison sentence of 20 years and a felony conviction on his record. Yet he can sell a case of whiskey to a minor and sustain only a wrist-slapping \$50 fine, which is considerably less than the profit he can make on the deal."

Gunnar Nirk, MD, writes on the school problems of disadvantaged children.

A.A. Savastano, MD, and Joseph Navach, MD, discuss the delicate feedback mechanisms by which vitamin D, parathormone and thyrocalcitonin regulate calcium homeostasis.

The nutritional implications of regional enteritis, and the feasibility of long-term, high caloric parenteral therapy, are discussed by Spyros K. Tamvakopoulos, MD, Edgard Turnier, MD, Michael S. Barrett, MD and Henry T. Randall, MD

Robert V. Lewis, MD, reviews, with great wit and insight, Russel Brain's collected essays on the nature of genius.

IMAGES AND PATTERNS IN MEDICINE

Interpretation and Comment

(cf Page 121)

GALLSTONE ILEUS

A calcified gallstone is seen in the right lower quadrant. Gallstone ileus is a form of intestinal obstruction produced by mechanical impaction of one or more gallstones within the lumen of the bowel. Many patients have a history of prior attacks of cholecystitis, perhaps causing adhesions between the gallbladder and an adjacent part of the digestive tract. A stone erodes into a contiguous viscus where it may pass spontaneously, be vomited out, or impact and obstruct.

The most frequent site is the terminal ileum. Obstruction in gallstone ileus is termed "tumbling" obstruction because symptoms are commonly intermittent as the stone impacts, then becomes free before moving distally and re-obstructing.

Patients may have complained of prior attacks of pain consistent with acute cholecystitis. Symptoms produced once the biliary-enteric fistula occurs are frequently those of partial intestinal obstruction that may exacerbate and wane as the stone moves distally.

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The Days of Our Years

Methuselah, notes Genesis, lived for 969 years before he died. No mortal listed in the Scriptures is said to have lived longer, although many, such as his son, Lamech (who later was father to Noah) lived equally astonishing intervals. The patriarchs, in the nine generations intervening between Adam and Noah, each lived an average of 858 years. Then came the troubled days immediately preceding the great floods; these, according to the Bible, were days of moral debasement when the earth became corrupt. Henceforth, human longevity was to be shortened. Referring to man, the Lord said: "My breath shall not abide in man forever, since he, too, is flesh; let the days allowed him be one hundred and twenty years."

Perhaps the impressive longevity of the antediluvian patriarchs was poetic metaphor (the psalmist notes "For a thousand years in thy sight are but as yesterday . . ."), perhaps it was mythic bravado retained by the generations of biblical scribes, or perhaps it was merely fanciful records-keeping. But this is certain: Since the great floods—and despite the many anecdotes of yogurt-eating goat-herders from the Caucasus—we have no authenticated instance of a human surviving more than the biblical 12 decades. Indeed, most current biology texts use 120 years as the upper limit of human survival. Shigichio Izumi of Kyushu, Japan, survived 120 well-documented years before dying in 1986.

Human history, despite its burdens of famine, wars and pestilence, has been a gratifying chronicle of increasing longevity, approaching, but rarely if ever reaching, the Scriptural frontier of 120 years. Consider the sample figures, from England and Wales listed below, which show, on average, a steady improvement in the length—if not necessarily the quality—of life. In recent decades, each new calendar year has added about 3 additional months of life

expectancy for a newborn in, for example, England. Thus a baby born in London in 1993 will live, on average, one-fourth of a year longer than one born in 1992.

Years of Life Expectancy (males & females)

1541	33.7 yrs
1661	35.9
1781	34.7
1846	40.9
1875	43.0
1895	46.0
1962	70.9
1984	74.8

There continue to be vast differences in the life expectancies among, and within, today's nations of the world. Countries, or peoples, that are less developed (in terms of per capita wealth, education and access to public health resources) tend to be encumbered with shorter average life spans. The average life expectancies in impoverished countries such as Haiti or Burkina Fasso hover about 40 years. In wealthy nations such as Sweden, life expectancy for males now exceeds 73.8 years and for females, 79.7 years. In Japan, comparable figures are 75.6 years for males and 81.4 years for females. In the wealthier nations, about 31% will live beyond 85 years and 1.5% will survive beyond their 100th birthday. In the United States, the average 85-year-old may now look forward to an additional 6.2 years of life. In the wealthiest nations a small but increasing fraction of the very elderly will undergo what is now called healthy aging (ie, traversing the 9th and 10th decades with reduced morbidity). But for most of those living beyond 85 years, vulnerable to the customary ravages of senility, there are no winners—only survivors.

The increased longevity that characterizes this century leads to some curious realities. The average woman in the industrialized nations may now anticipate spending more years in nurturing her elderly parents

than in bringing up her children.

The gender differential favoring the female is a fairly universal observation except for certain less-developed nations (such as India or Bangladesh) where prevailing social customs discriminately favor the male infant, resulting in greater overall life expectancy for males. But even in such countries, females who survive beyond the child-bearing years will live longer than will males of the same region and socio-economic class. Some of this gender discrepancy, of course, may be ascribed to fatal injuries (industrial, interpersonal, military) that selectively befall males. Yet when the elements of social aggression and trauma are substantially eliminated (eg, by studying survival duration only in those aged 65 years or older) the female advantage persists. In the United States, for example, 65-year-old males may expect another 14.7 years of life; 65-year-old females, however, may anticipate 18.6 further years. Biologic laws seem to be pitilessly observed.

What of other living creatures? Records are hard to come by since death certificates are not a feature of the jungle. Nevertheless some reliable information can be derived from records kept on banded feral animals and more particularly on animals maintained in captivity. Amongst mammals (indeed, amongst all vertebrates) the human lives the longest. Very large mammals (eg, Indian elephant (70 years), fin whale (+80 years), hippopotamus (51 years)) have longer life-spans than smaller mammals (eg, goats, 18 years). Large rodents such as the beaver live about 21 years while small rodents such as the Norwegian rat live but 3.5 years. This same size-related survival advantage exists within the various species of birds. Those avian species with the lengthiest life spans are such large birds as the condor (+65 years) and the raven (69 years). The very small birds (eg, hummingbirds), in general, have much shorter life spans. This rule seems to persist amongst the reptiles as well. Thus, the American alligator

lives up to 56 years and the large box turtle lives 88 years, while the common frog lives but a maximum of 6 years. Amongst marine invertebrates, certain large crayfish (*Astacus fluviatilis*) are said to live 30 years, large mussels (*Margaritana margaritifera*) may survive for 60 years. Small scallops, on the other hand, live only 2 years. The earthworm (*Lumbricus terrestris*) may live to 6 years while the large leech (*Hirudo medicinalis*) continues for 27 years. Amongst the parasitic worms, the excessively lengthy *Taenia saginata*, the tape-worm, is known to live as long as 35 years. Amongst insects, females survive substantially longer than males. The queen honey-bee (*Apis mellifera*) lives about 18 months while the worker lives 11 months and the drone, 6 months. The queen ant (*Formica fusca*) lives almost 3 times longer than the worker male ant.

What general principles seem to underlie the life expectancies of the various species?

- 1 It must first be appreciated that the longevity-potential of many species has not yet been fully realized. The common mouse (*Mus musculus*), for example, survives under allegedly ideal (protected) living circumstances an average of 1,412 days. If, however, its food intake is severely restricted, the animal will survive substantially longer, living on average, 1,742 days. Ad libitum feeding in many species seems to be a risk factor hampering survival.
- 2 While there is much variation in life expectancy within each species (determined in great measure by ambient hazards including nutritional and social factors), maximum life expectancy for each species seems to be a genetically determined, fixed span. This does not, of course, preclude future evolutionary changes modifying these survival limits.
- 3 The average species life expectancy appears to vary directly with the (brain weight) (total body weight) ratio. Thus, species with a higher degree of encephalization tend to live longer. This is such a reproducible, widely observed phenomenon that quantitative biologists have reduced this to the following formula:

$$\log_{10} \text{life expectancy (days)} = 64 \times \log_{10} \text{brain weight (g)} - 0.23 \times \log_{10} \text{body weight (g)} + 1.035$$
- 4 In general, bulkier animal species live longer than smaller species within the same biological family, such as the rodents or primates. There are notable exceptions to this amongst breeds of dogs (eg, small terriers live quite long) but this may be the result of the genetic pressures exerted by selective inbreeding.
- 5 Species that invest more time in the rearing of individual offspring, with smaller

numbers of offspring per pregnancy, and with substantial delays in the sexual maturation of their young, seem on average to live longer lives.

These longevity records for humans, elephants and box turtles seem quite impressive until we confront, in awe, the sequoia trees with their life expectancies measured, not in years, but millennia. Only then do we give credence to the words of the psalmist: "For I am but thy passing guest, a sojourner like all my fathers."

Stanley M. Aronson, MD

Callow Youth, Shallow Youth

In the United States Army, nothing is perceived to be more expendable than the newly commissioned second lieutenant. In the world of medicine, too, both the senior medical student and the recently minted physician are viewed as ineffectual, perversely arrogant, woefully ignorant, in need of ceaseless supervision, a palpable danger to patients, and utterly incapable of making a tangible contribution to our store of medical knowledge. How true are these beliefs?

As long as medicine has operated within a rigidly hierarchical system of tutorial education, the silver-haired, white-coated mentor has always been stationed at the

upper end of the spectrum—the anxiety-prone, sleep-deprived, acneiform clinical clerk at the nether end—while the intervening ranks are congested with striving physicians possessing varying measures of spasticity, equanimity and wisdom. The lowly clinical clerk, his head stuffed to the fontanelles with undigested data, is barely tolerated in public by his elders. In private, he is viewed as an aggressive, intensely competitive, mean-spirited soul, incapable of original thinking, and with the ethics of a scorpion.

These perceptions, reinforced by generations of disparaging anecdotes, suggest that the 4th-year medical student is an ego-centric menace convertible to a mature, magnanimous, scientifically creative physician only after years of patience and residency training. (Question: How many medical students does it take to unscrew a light-bulb? Answer: One; he holds the bulb securely and the world then revolves around him.) These beliefs, though nurtured for generations, are simply not true.

Most medical school administrators, particularly since 1960, will freely acknowledge that upper class medical students have been in the front ranks of those who advocate greater emphasis upon primary care, the obligation to develop socially conscious attitudes in medicine, the need for a broadened medical education agenda to embrace biomedical ethics as well as the need to

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address problems of chemical dependency, homelessness, the diseases of poverty, and the value of having the ranks of physicians reflect more faithfully the general population. Medical students, far more than their faculty, have been relentlessly in favor of curricular change to reflect and incorporate these social imperatives. Youth is not always a blunder.

And what of the alleged paucity of creative scientific insight by mere medical students? Here, too, the record belies the belief that medical students attend classes without a thought to original scientific research; or that their free time is invested solely in devised ways of obtaining elitist residencies. Consider the following precocious accomplishments of medical students.

While the first comprehensive clinical description of multiple sclerosis is credited to Charcot (1868), the earliest pathologic description of the disease, including meticulous drawings of the demyelinating plaques, is ascribed to Carswell in 1838. Between semesters, this London medical student studied in some of the larger hospitals of Paris. During his stay in the autopsy suite of the Salpetriere Hospital, he came across a brain specimen with white matter changes sufficiently unique to justify assembling a brief but seminal paper, which he published later that year in England. Yet another great clinicopathologic study was advanced in 1862 by a French medical student, Maurice Raynaud (*De l'Asphyxie Locale et de la Gangrène Symétrique des Extrémités*) when he described an entity now called Raynaud's disease.

In 1846, a senior medical student from Copenhagen, Peter Panum, was assigned to the Faroe Islands as part of his public health obligations. His arrival on the North Sea islands coincided with a major measles epidemic. While attending to his clinical duties, Panum assembled epidemiologic data that formed the basis for his famous monograph on measles. He demonstrated, for example, the airborne nature of measles contagion, determined the incubation period, the age-related mortality rates, and that infection conferred lifetime immunity. His text was in the forefront of those efforts that used quantitative modeling methodologies to better understand the dynamics of communicable disease.

It is hard to believe that major parts of human organs—or even entire organs—were left unrecognized until recently. Anatomic discoveries are somehow thought of as the product of an ancient era. Yet the parathyroid gland was not recognized until 1877 when Ivar Sandstrom, a Swedish medical student at Uppsala University, described: "... on both sides at the inferior

border of the thyroid gland an organ of the size of a small pea ... and upon histological examination showed a rather peculiar structure." Similarly, Paul Langerhans, a University of Berlin medical student, first described in 1868 the endocrine components of the pancreas, the islet cells. In 1903, through diligent dissection in beef and humans, Martin Flack demonstrated the existence of the sino-auricular node (cardiac pacemaker) while studying at Oxford.

When Walter Cannon was a medical student at Harvard (1896), he heard of Roentgen's recent discovery of X-rays. Cannon then devised an ingenious means of studying gastric motility in intact experimental animals by feeding them with radio-opaque bismuth and then studying serially taken X-rays of the abdomen. Historians state that this represents the first G.I. series.

Henry Morton was a matriculating Harvard medical student (though previously a practicing dentist) when in 1846 he administered ether (called then sulfuric ether) to a

patient at Massachusetts General Hospital. This monumental event is justifiably regarded as one of medicine's most significant advances. The first recorded use of nitrous oxide for analgesic purposes, was also the labors of a youthful Humphry Davy. In 1799, when he was but 19, he wrote about his experiences in alleviating the pain produced by wisdom teeth (*dentes sapientiae*): "I breathed three large doses of nitrous oxide. The pain always diminished after the first four or five inspirations."

Paul Ehrlich's contributions to medical science, particularly immunology and chemotherapy, are numerous and diverse. His genius was apparent even as a medical student when he published a paper (1877), and then later a lengthy thesis, on the affinities of biological dyes for certain intracellular elements. He proposed the idea of employing special stains to demonstrate the existence of chemical substances in biopsied tissue, initiating the science of histochemistry. A few years later, he devised a means of

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identifying the tubercle bacillus microscopically, a procedure that today is called the acid-fast stain.

Eugene Opie and William MacCallum were both members of the inaugural class of the Johns Hopkins Medical School. As a research project, they jointly undertook to study the morphology and life cycle of parasites infesting the red blood cells of certain birds. Through patience and objective serial observations they noted that there were two distinguishable kinds of mobile parasites (gametocytes) and that one fertilized the other. Their insight into the sexual/ sporogenic components of blood-borne protozoan parasites formed the foundation for understanding the pathogenesis of such diseases as malaria and trypanosomiasis.

There are three notable advances in 20th century therapeutics that are attributed to the genius of medical students. In 1916, between semesters at Johns Hopkins Medical School, Jay McLean labored on the problem of purifying the cephalin-like substances that were believed to be instrumental in blood clotting. While studying yet other thromboplastic phosphatides, he encountered one from the liver (called hepar-phosphatid) which, to his surprise, possessed striking *anticoagulant* properties. He called this new substance, heparin. In 1919, a Viennese medical student named Alfred Vogl noticed that a new mercurial drug for the treatment of syphilis, Novasurol, increased the daily urinary output in his luetic patients. He then tried the drug on a nonluetic patient with severe congestive cardiac failure, again producing a marked diuresis. Thus was discovered the mercurial diuretic agents. In 1921, Charles Best, a medical student in Toronto working with Banting (and later MacLeod and Collip) isolated what is now called insulin.

These are but a few examples of the novel contributions which young, vigorous and adventuresome minds have made to our therapeutic and pathophysiologic resources. Insulin, heparin, mercurial diuretics—not a bad yield for a few modest research fellowships. The first 30 years of life, it has been said, give us the text; the years beyond that supply but commentary. "Your old men shall dream dreams," says Scripture, "but your young men shall see visions."

Stanley M. Aronson, MD

From Another Perspective

Occasionally, RHODE ISLAND MEDICINE receives manuscripts with subject matter departing materially from the conventional, but which nevertheless offer gifted insights for the thoughtful physician-

reader. Many of these manuscripts, in the past, had been rejected because the journal was not sufficiently open to appreciate their value. These contributions, insofar as they are submitted and reviewed, shall now be found in a new column called "From Another Perspective." These brief articles are segregated from the usual clinical papers for the same reason that chamber music and grand opera are offered in separate settings: To be heard best, they each require a home that is expressly and uniquely supportive of their individual "voice."

The inaugural piece in this occasional column, written by James E. McLennan, MD, is at first glance a movie review. But on a deeper level it perceptively explores pernicious parts of interpersonal behavior that few beside physicians—and perhaps clergy and social workers—may encounter on a frequent basis.

RHODE ISLAND MEDICINE encourages its readers to consider contributing to this quasi-clinical corner of the journal. While editorial standards will continue to be observed, we nevertheless actively seek articles (and not necessarily on conventional clinical material) which will serve in some fashion to inform, to educate, the practicing physician. In the past century, the journal has increasingly provided a forum for the serious and considered voice of the practicing physician. In calendar 1904, for example, only 23 physicians contributed to the journal. Through encouragement by a succession of editors this number has steadily increased; and just during the year 1993, over 160 members of the medical community have contributed articles to this journal.

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Guillain-Barre Syndrome: A 5-year Rhode Island Hospital Experience

May Louie, MD, James M. Gilchrist, MD,
Craig Woodard, MD, PhD

Guillain-Barre-Strohl syndrome (GBS) was first described in 1916¹ and is characterized by rapidly ascending paralysis, areflexia, paresthesia with slight impairment of objective sensation and albuminocytologic dissociation in the cerebrospinal fluid (CSF). These symptoms progress to a nadir within 4 weeks but most often within a few days to 2 weeks. A plateau of maximal disability ensues before improvement occurs, usually with the patient returning to a functional level approximating previous abilities, though this may take months to years. At nadir, patients frequently are quadriplegic and require ventilatory assistance as well as supportive care incumbent upon their severe disability. There are pure motor, pure sensory, pure pandysautonomic and Miller-Fisher variants, as well as forms that are not generalized but affect only certain anatomic regions, eg, paraparetic and pharyngeal-cervical-brachial variants.² Autonomic dysfunction is common, and complications are frequent, from dysautonomia, respiratory involvement and bed-ridden state.

GBS is the result of a cell-mediated immunologic attack upon Schwann cells and nerve myelin.³ The trigger is unknown but has been postulated to be related to recent infection in a majority of patients.^{4,5} Macrophages invade the endoneural structures, disrupting Schwann cells and phagocytizing myelin segmentally and near the Nodes of Ranvier.³ Proximal nerves are affected

preferentially, such as ventral nerve roots, nerve trunks and plexuses, though more distal peripheral nerves and autonomic ganglia also are affected.³ The axon is not involved initially except for a rare axonal variant⁶ but can be destroyed in severe forms of the disease. Schwann cells survive and retain the ability to divide and form new myelin. Recovery depends upon remyelination, which can begin within 2 weeks of onset, and axonal regeneration, which continues at a much slower rate and can take many months to complete.

Table 1.—Functional scale⁷

- 0 No symptoms
- 1 Minor signs or symptoms
- 2 Able to walk 15 ft (5 m) without support but incapable of manual work
- 3 Able to walk 15 ft (5 m) only with cane, appliance or support
- 4 Bed- or chair-bound
- 5 Requiring mechanical ventilation
- 6 Dead

Despite the reversible nature of the neurologic deficits in GBS, intervention through plasmapheresis clearly can shorten hospital stay, improve time to independent walking and decrease time on mechanical ventilation.⁷ The most widely held indication for plasmapheresis in GBS is inability to walk 5 meters unassisted, which encompasses the majority of GBS patients.⁷ Recently, a Dutch study has indicated intravenous human immune globulin may be as beneficial as plasmapheresis.⁸

Rhode Island Hospital is the only tertiary care center in Rhode Island providing plasmapheresis. This, combined with Rhode Island Hospital's reputation as a tertiary care center for neurologic and neuromuscular diseases, provides an opportunity to assess the peculiarities, if any, of the patient population afflicted with GBS, their course and treatment, in Rhode Island.

Methods

As a major tertiary care center, Rhode Island Hospital also offers primary and sec-

...electrodiagnostic studies... looking for evidence of demyelination such as temporal dispersion, slowing of conduction velocity and conduction block, are most useful in confirming the diagnosis of Guillain Barre syndrome when it is clinically suspected.

ondary care. Most significant cases of GBS are either seen in this hospital or referred here for plasmapheresis and neurologic and pulmonary care. We reviewed charts from those patients discharged from RIH with the diagnosis of GBS between July 1, 1987, and June 30, 1992, coinciding with the tenure of one of the authors (JG). During this period, 51 patients were seen with GBS according to clinical, laboratory and electrodiagnostic criteria.

Rhode Island Hospital charts were reviewed for these 51 patients, pertaining to demographic, clinical, laboratory, and electrophysiological studies. Patients sent to other hospitals for less acute care or rehabilitation were not reviewed. The patients' condition at admission, clinical nadir and discharge was determined and scored, using the scale developed for the North American Plasmapheresis Trial⁷ (Table 1).

During review of electrophysiological studies, conduction block was defined as a decrease in the compound motor action potential (CMAP) amplitude of 30% or greater from distal to proximal stimulation sites, without dispersion, except for the tibial nerve in which the amplitude decline had to be greater than 75%. Dispersion was defined as an increase in the CMAP duration of greater than 15% from distal to proximal sites. Distal CMAP amplitude per patient was taken as an average of all motor nerves studied. Average nerve conduction velocity was calculated excluding those nerves for which no response was obtained.

ABBREVIATIONS USED

CMAP: compound motor action potential
CSF: cerebrospinal fluid
EMG: electromyography
ICU: intensive care unit
GBS: Guillain Barre Strohl syndrome
GI: gastrointestinal tract
HIV: human immune deficiency virus
MGH: Massachusetts General Hospital
RIH: Rhode Island Hospital

May Louie, MD, and Craig Woodard, MD, PhD are fellows in EMG and Neuromuscular Disease, and James M. Gilchrist, MD, is associate professor of neurology, all with the Department of Clinical Neuroscience, Brown University School of Medicine, and Department of Neurology, Rhode Island Hospital, Providence, Rhode Island. This paper was originally presented at Department of Neurology Grand Rounds, Rhode Island Hospital, February 1993.

Table 2.—Clinical characteristics of patients

No.	Age	Sex	Antecedent Illness	Time to nadir (days)	Function at admission	Function at nadir	Function at discharge	Total days in hospital	CSF Protein (mg/dl)
1	57	M	N	4	4	5	3	81	186
2	60	F	Y	0	4	4	2	41	47
3	62	M	Y	1	3	4	3	52	128
4	84	M	N	6	3	5	5	19	111
5	60	F	Y	0	2	2	0	0	24
6	28	F	Y	1	2	4	4	84	30
7	69	F	N	1	4	5	2	57	34
8	17	F	Y	8	2	4	2	51	111
9	74	M	Y	0	2	2	2	0	45
10	69	F	Y	3	4	5	3	117	165
11	49	F	N	1	3	5	2	100	100
12	60	M	N	5	2	4	4	101	104
13	51	M	N	0	5	5	2	130	173
14	27	F	N	2	2	3	3	4	176
15	58	M	Y	0	1	1	0	4	88
16	41	M	Y	6	4	5	6	102	204
17	62	M	Y	0	4	4	3	136	300
18	73	F	N	9	3	5	3	108	52
19	33	F	N	2	1	2	1	10	75
20	27	F	N	0	4	4	2	28	232
21	38	F	Y	3	1	4	2	26	25
22	17	M	Y	3	3	4	2	12	82
23	30	M	Y	0	4	4	3	29	24
24	72	F	N	1	4	6	0	10	168
25	61	M	Y	9	4	4	3	41	90
26	69	M	N	3	2	3	0	17	66
27	35	M	Y	7	1	5	3	56	0
28	56	M	N	5	4	5	4	21	242
29	28	M	Y	4	4	5	3	30	59
30	1	F	Y	4	4	5	4	15	392
31	76	F	Y	0	4	4	2	21	88
32	77	F	N	2	4	6	0	37	33
33	77	M	Y	8	2	4	2	57	81
34	40	M	Y	0	4	4	2	21	136
35	27	F	Y	4	2	4	2	26	130
36	16	M	N	5	3	5	3	20	69
37	71	M	N	10	4	6	0	12	290
38	4	F	Y	1	3	3	2	12	184
39	38	F	Y	19	1	4	3	75	47
40	57	F	Y	5	5	5	3	99	206
41	13	F	N	1	1	1	1	7	30
42	4	M	Y	3	2	4	3	10	66
43	66	M	N	1	4	5	5	0	244
44	22	F	N	0	2	2	2	1	54
45	22	M	Y	0	2	2	2	18	22
46	58	F	Y	12	2	5	3	125	47
47	55	M	Y	5	2	4	3	17	121
48	64	M	N	1	4	4	3	73	83
49	1.3	M	Y	0	4	4	4	12	80
50	70	F	N	10	3	4	3	47	112
51	71	M	Y	1	4	4	3	74	100

Results

Of the 51 GBS patients admitted to RIH in the 5-year period (Table 2), 27 were male. Their age ranged from 1 to 84 years with an average of 47 years. For the population of Rhode Island, this gives an approximate incidence of 1 per 100,000 per year. Thirty-four of the patients were first seen at RIH, while 17 were seen at other institutions before transfer to RIH. Patients pre-

sented throughout the year, but the winter (December-February) (31%) and autumn months (September-November) (27%) accounted for a little more than half. Spring (March-May) had 20% and summer (June-August) 22% of admissions.

Thirty-one (61%) patients recalled an antecedent event, such as an infection (most often viral), in 27 patients, vaccination (1), surgery (2) or childbirth (1). On average,

this event preceded the onset of symptoms by 1.4 weeks. The average interval between symptom onset and presentation was 5 days. The disease progressed rapidly with 60% of patients reaching their clinical nadir within 3 days of hospital admission (range 0 to 19 days). At time of presentation, 12% of patients were functional class 1, 27% were class 2, 16% were class 3, 41% were class 4 and 4% were class 5. Four patients had no

weakness at presentation. Sensory symptoms were common at presentation, and 80% of patients reported them at some time in the course. These were most often sensations of tingling and paresthesia but were painful in 14% of cases.

At clinical nadir, 42% of patients were class 4, 31% were class 5, and 4 (7.8%) were dead. One died from pre-existing Burkitt's lymphoma, 2 succumbed to Adult Respiratory Distress Syndrome and 1 died from pulmonary embolus (despite subcutaneous heparin). These last 3 patients were older (all over 70 years of age; average 73 years) and were functional class 4 on presentation.

Autonomic disturbances were noted in 41% of the patients. The most commonly reported abnormalities were urinary retention (24%) and unstable blood pressure (27%). Other symptoms of dysautonomia were constipation (8%), ileus (8%), tachycardia (12%) and diaphoresis (4%). These patients were older (mean, 55.7 years vs 47), spent more time on ventilatory assist (mean, 18 days vs 9), more time in the ICU (mean, 9 days vs 6), had a longer total hospital stay (mean, 58 days vs 44) and were more likely to have a complication (90% vs 69%) than the average patient. Eighteen patients had paresis or paralysis of facial muscles, two had involvement of the sensory portion of the trigeminal nerve, and one patient had isolated weakness of the abducens nerve. A single patient had the Miller-Fisher variant of GBS with involvement of cranial nerves 3, 4 and 6.

As stated above, more than two-thirds of patients had at least one complication. Most common were pneumonia (15 patients), urinary tract infection (13 patients), and psychiatric problems (8 patients) including anxiety, depression and agitation and delirium. Other complications were hyponatremia (4 patients), syndrome of inappropriate anti-diuretic hormone (3 patients), skin ulcers (3 patients), deep venous thrombosis (3 patients), GI bleeding (2 patients), hypotension secondary to plasmapheresis (2 patients), bronchitis (2 patients) and pulmonary embolism (2 patients). There were single incidences of sleep apnea, subarachnoid hemorrhage, myocardial infarction, bone fracture, pneumothorax, keratitis and pulmonary edema. Pain was noted in only 14% of patients, but this is likely an under-reported symptom given the retrospective nature of the study.

By time of discharge from RIH, most patients were ambulatory, either without (31%, class 2) or with assistance (37%, class 3). Four percent of patients who were ventilator dependent at discharge were transferred back to other hospitals. Several patients were transferred to rehabilitation fa-

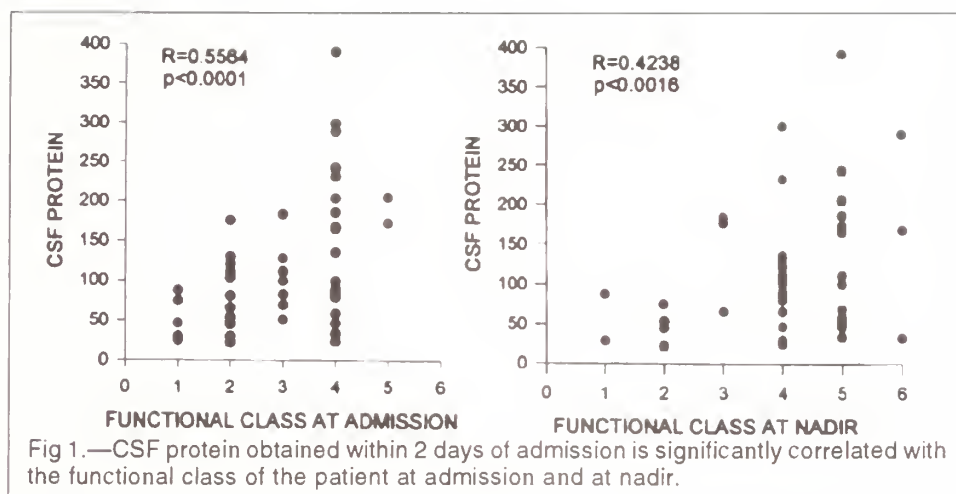


Fig 1.—CSF protein obtained within 2 days of admission is significantly correlated with the functional class of the patient at admission and at nadir.

cilities at other institutions. The discharge class represents function at discharge from RIH. Twenty-seven patients received inpatient rehabilitation at RIH for an average of 20 days. Three patients had recurrence of symptoms related to GBS, all three occurring after discharge from RIH though one was receiving inpatient rehabilitation at another hospital. All three responded to treatment, one patient receiving prednisone, another receiving prednisone and then plasmapheresis, and the third receiving intravenous human immune globulin.

Laboratory investigation failed to find an underlying cause for the GBS in all but one patient, including HIV infection, Lyme disease or dysgammaglobulinemia. The one exception was an 18-year-old with a mildly abnormal Lyme titer but no other symptoms or signs of Lyme disease. She was treated with intravenous antibiotics.

CSF examination was performed within 72 hours of hospitalization in 46 patients. The other 5 patients had CSF examination first done after 72 hours. For those done within 3 days, the average protein value was $113 \text{ ug/dl} \pm 83$, the average WBC count was

1.75 (range: 0-10; exclusive of the patient with Burkitt's lymphoma who had 126 cells) and the average glucose was $68 \text{ ug/dl} \pm 21$. There was a direct correlation between CSF protein level and functional class at presentation ($R=0.56$, $P<0.0001$) though also significant for functional class at nadir ($R=0.42$, $P<0.002$) and discharge ($R=0.31$, $P<0.023$) (Figure 1).

All except 4 patients underwent electrodiagnostic studies (EMG) within the first 2 weeks of hospitalization. There was a total of 72 studies with 15 patients having at least one follow-up examination. EMGs done on day of admission showed only minimal abnormalities such as absent or prolonged F wave latencies (50% of patients). Studies performed between days 1 and 3 of hospitalization showed increasing abnormalities with prolongation of distal latencies (average of 108% of normal), conduction block (21% of nerves), dispersion (7% of nerves) and increased prevalence of absent F waves (47% of nerves), consistent with an acute demyelinating neuropathy. A minority of patients (24%) had fibrillations or positive waves in scattered muscles. By hospital

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days 3 through 9, conduction velocities were reduced to an average of 75% of normal, distal motor latencies prolonged to 123% of normal, conduction block in 35% of nerves, temporal dispersion in another 29% of nerves and denervation in 50% of patients. A composite "average patient" would have now met electrodiagnostic criteria for GBS.⁹ Electrophysiological abnormalities continued to progress, reaching nadir between hospital days 16 to 30, at which time 75% of patients had denervation on EMG. After the 5th week, EMGs began to recover with improvements in CMAP amplitudes (to 97% of normal) and F waves (70% present) as the earliest signs. Subsequently, reversal of conduction block (only 10% of nerves so affected chronically) and dispersion (also only 10% of nerves) was seen with no further significant change towards normal of conduction velocities. Median-sural sensory response disproportionality (ie, the paradoxical finding that the median nerve is affected more than the sural nerve) was noted in only 1 of 72 studies.

Treatment directed at the underlying pathophysiology was almost exclusively limited to plasmapheresis: 65% of patients received a median of 5 exchanges. Of those who did not receive pheresis, 6 were considered too mildly affected, 2 were transferred from other institutions beyond the appropriate time frame (2 weeks from onset), 1 received intravenous human immune globulin, and 4 patients received steroids (1 for a single dose, and 1 because of preexistent steroid-dependent inflammatory arthritis). One patient refused plasmapheresis for religious reasons, and 3 were children who were not felt to have indications for it. One child received plasmapheresis elsewhere.

Poor prognostic indicators included age greater than 40, need for mechanical ventilation and amplitude of average distal CMAPs less than normal. The presence of each (and they coincided frequently) indicated longer ICU, rehabilitation and total hospital stays, frequent dysautonomia and a virtual guarantee of complications. Functional class at discharge was worse for those patients requiring ventilatory assistance and with small CMAPs.

Discussion

Guillain-Barre syndrome is not rare: incidence is 1 to 3 per 100,000,⁴ and most physicians will encounter at least a few cases during their careers. In 1987, one of the authors (JMG) with a particular interest in disorders of the peripheral nervous system arrived at RIH. His interest, coupled with the tertiary care role of RIH and the lack of other plasmapheresis facilities in the region brought about the unusual situation

in which the bulk of patients with this particular disease were examined, diagnosed and cared for within a single institution serving a large population within a specific geographic area (Rhode Island, southeast Massachusetts and eastern Connecticut). Thus, we felt it appropriate to review our experience with GBS since 1987 since it could clarify the clinical characteristics, management needs and prognosis of GBS in Rhode Island and vicinity.

Several clinical surveys of GBS have preceded ours, and, as such, our review is not unique.^{4,10,11} The most extensive study to date is the Massachusetts General Hospital (MGH) retrospective (153 patients) and prospective (120 patients) series.⁴ The clinical characteristics, course, complications, and CSF and electrodiagnostic findings of all patients seen during a 26-year period were documented. The first large series was that of Haymaker and Kernohan¹⁰ who detailed 50 fatal cases and reviewed the literature to that time (1949). Leneman reviewed the literature between 1949 and 1966 (1100 cases).¹¹ and other large series exist (references upon request).

One unique finding of this study was the statistically significant correlation between CSF protein on admission and clinical function (Figure 1). Previous studies did not find this. However, the MGH study compared only 2 groups: those with elevation in CSF protein and those with normal CSF.⁴ Elevation in CSF protein is believed due to breakdown of the blood-brain barrier from inflammation, and it is not surprising that those patients with more fulminant inflammation would have greater CSF protein and a more tumultuous course from onset to discharge.

Most surveys of GBS did not find a

seasonal incidence,^{4,10,11} with a few exceptions. Among others, studies from Belgium,¹³ England,¹⁴ and New York-New Jersey¹⁵ did find seasonal variation with an increased incidence in autumn and winter months, as did our study (58% fall and winter months vs 42% spring and summer months). The MGH study,⁴ in the same geographic and climatic region as ours, found no significant seasonal incidence. This question is of some significance because if GBS is indeed precipitated in the majority of patients by an antecedent infection, then an increased incidence of GBS would be expected proportionate with the increase in viral infections in the colder months. The incidence of antecedent events in our patient population (61%) is the same as other studies.^{11,12} One case occurred after adult measles vaccination. Post-vaccinal GBS has been reported after rabies, measles, rubella, hepatitis B, polio, tetanus, and most notably, influenza vaccines.^{12,16} No difference has been detected in the onset, course or ultimate outcome of GBS, whether the presumed precipitant was vaccinal, viral or unknown.

Pain was present in 14% of our patients. Ropper reports an incidence up to 72%.^{4,17} Pain can manifest as intense paresthesias, deep ache or stiffness that occasionally may resemble sciatica. The pain has been postulated¹⁷ to be due to spontaneous ectopic firing of intermediate-sized nerve fibers originating from deep pain receptors. Involvement of pain fibers innervating the dura at the level of the nerve root by inflammation may also contribute. Stiffness may result from prolonged immobilization, indicating the importance of early passive range of motion and more extensive physical therapy as the patient recovers.

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A number of dysautonomic symptoms were reported; the most frequent being unstable blood pressure and urinary retention. The instability in blood pressure is believed due to an afferent lesion in the baroreceptors resulting in failure to suppress vasodepressor stimuli. Use of pressors may cause excessive increase in blood pressure due to this impairment in baroreflexes. Therefore, pressor use may be deleterious as well as unnecessary, since the decreases in blood pressure are mostly transient. Urinary retention was reported in 14% of patients in the MGH retrospective series and in 21% of the MGH prospective series,⁴ comparable to our experience, and indicating it is a more common occurrence than is often believed. Urinary retention is usually due to bladder and detrusor paralysis. Other studies^{4,18} have found the incidence of autonomic dysfunction as high as 65%. Those patients with regional variants of GBS or the chronic form are less likely to be affected.

The time course of the electrophysiological changes are consistent with a primary demyelinating process and roughly parallel the clinical course, with mild changes at approximately 1 week from symptom onset (F wave abnormalities), an increase in abnormalities by the end of the second week (conduction disturbance, conduction block, smaller CMAPs), and severe dysfunction

evident during the third to fifth weeks (slow conduction velocity, temporal dispersion and decreased amplitude of CMAPs, conduction block, denervation potentials). Signs of recovery appear in electrodiagnostic studies after the 5th week. Our patients reached their clinical nadir by an average of 8 days from symptom onset, which preceded the electrophysiological nadir. Previous investigators have also found the clinical course does not necessarily mirror electrophysiological trends.¹⁹ Rather, electrodiagnostic studies, when carefully performed, looking for evidence of demyelination such as temporal dispersion, slowing of conduction velocity and conduction block, are most useful in confirming the diagnosis of GBS when it is clinically suspected.

There are other polyneuropathic syndromes with demyelination and variable axonal involvement on electrodiagnostic studies, including HIV infection, hereditary sensorimotor neuropathy, Lyme disease, diphtheria, various gammopathies and lymphoma. HIV may produce an acute demyelinating neuropathy clinically indistinguishable from GBS except for the presence of white cells in the CSF (up to 50), while gammopathy, diphtheritic and lymphoma associated neuropathies are usually more chronic in presentation.

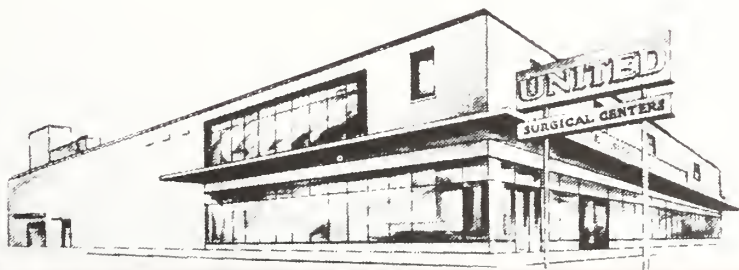
In a disease such as GBS, which is so

often swift in onset and devastating in impact, yet with an ultimately favorable outcome, prognosis can be a very useful tool for the clinician and the patient. In the North American Plasmapheresis Trial,²⁰ four independent factors were useful for prognostication: 1) age; 2) need for mechanical ventilation; 3) whether the patient received plasmapheresis; and 4) whether the distal CMAP amplitude was less than 20% the normal lower limit. These indicators could be combined to then predict the likelihood of independent ambulation at 3 and 6 months.²⁰ For instance, a 60-year-old patient, less than 7 days after onset and needing mechanical ventilation with small CMAP amplitudes, had a 39% chance of independent ambulation at 6 months if he received plasmapheresis and a 19% chance if he did not. Our series is much too small to duplicate such a helpful chart but we were able to test the prognostic indicators for accuracy. Age over 40 and mechanical ventilation were indeed prognosticators of severity of disease course, including length of ICU and hospital stay, risk of dysautonomia and complications. We also found that distal CMAP amplitudes less than the normal limit were associated with a longer course and poorer outcome. As the vast majority of our patients who had indications for plasmapheresis subsequently received it, we can only

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assume they would have done worse without it. Surprisingly, the degree of CSF protein elevation was associated with disease severity and outcome.

In summary, we present 51 patients with Guillain-Barre syndrome between July 1987 and July 1992, diagnosed and cared for in a reasonably consistent manner. All but 4 survived (1 died of another, preexistent, disease). The course, diagnostic test results, outcome, length of stay, treatment, complication rate, incidence of dysautonomia and prognostic factors are reviewed. GBS remains a largely clinical diagnosis that needs to be diagnosed early for proper supportive and management care. The patient has a good prognosis if such is attained, a prognosis made even better when early therapeutic intervention with either plasmapheresis⁷ or intravenous human immune globulin⁸ are used. Factors that suggest a prolonged and more tumultuous course include high elevations of CSF protein, age over 40 years, the need for mechanical ventilation and distal CMAP amplitudes below the lower limit of normal.

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- **Low incidence of adverse effects**

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From Start To Finish**

Once-a-day

Claritin[®]
10 mg (loratadine)
TABLETS

* In studies with CLARITIN Tablets at doses 2 to 4 times higher than the recommended dose of 10 mg, a dose-related increase in the incidence of somnolence was observed.

† Relief began in 13% of treated patients vs 4% of placebo-treated patients within 30 minutes (P=.04). At 2 hours, 48% of patients receiving placebo experienced relief. Distribution of onset times was significantly earlier for CLARITIN Tablets vs placebo (P=.03).

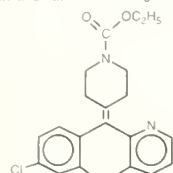
Please see following page for brief summary of Prescribing Information.

CLARITIN® brand of loratadine TABLETS Long-Acting Antihistamine

PRODUCT
INFORMATION

DESCRIPTION CLARITIN Tablets contain 10 mg micronized loratadine, an antihistamine to be administered orally. They also contain the following inactive ingredients: corn starch, lactose, and magnesium stearate.

Loratadine is a white to off-white powder not soluble in water, but very soluble in acetone, alcohol, and chloroform. It has a molecular weight of 382.89, and empirical formula of $C_{27}H_{35}ClN_2O_2$, its chemical name is ethyl 4-(8-chloro-5,6-dihydro-11H-benzo[5,6]cyclohepta[1,2-b]pyridin-11-ylidene)-1-piperidinecarboxylate and has the following structural formula:



CLINICAL PHARMACOLOGY Loratadine is a long-acting tricyclic antihistamine with selective peripheral histamine H_1 -receptor antagonistic activity.

Human histamine skin wheal studies following single and multiple oral doses of CLARITIN Tablets have shown that the drug exhibits an antihistaminic effect beginning within 1 to 3 hours, reaching a maximum at 8 to 12 hours and lasting in excess of 24 hours. There was no evidence of tolerance to this effect after 28 days of dosing with CLARITIN Tablets.

Pharmacokinetic studies following single and multiple oral doses of loratadine in 115 volunteers showed that loratadine is rapidly absorbed and extensively metabolized to an active metabolite (descarboethoxyloratadine). The specific enzyme systems responsible for metabolism have not been identified. Approximately 80% of the total dose administered can be found equally distributed between urine and feces in the form of metabolic products after 10 days. The mean elimination half-lives found in studies in normal adult subjects ($n = 54$) were 8.4 hours (range = 3 to 20 hours) for loratadine and 28 hours (range = 8.8 to 92 hours) for the major active metabolite (descarboethoxyloratadine). In nearly all patients, exposure (AUC) to the metabolite is greater than exposure to parent loratadine.

In a study involving twelve healthy geriatric subjects (66 to 78 years old), the AUC and peak plasma levels (C_{max}) of both loratadine and descarboethoxyloratadine were significantly higher (approximately 50% increased) than in studies of younger subjects. The mean elimination half-lives for the elderly subjects were 18.2 hours (range = 6.7 to 37 hours) for loratadine and 17.5 hours (range = 11 to 38 hours) for the active metabolite.

Loratadine dosed once daily, had reached steady-state by the fifth daily dose. The pharmacokinetics of loratadine and descarboethoxyloratadine are dose independent over the dose range of 10 to 40 mg and are not significantly altered by the duration of treatment.

In the clinical efficacy studies, CLARITIN Tablets were administered before meals. In a single-dose study, food increased the AUC of loratadine by approximately 40% and of descarboethoxyloratadine by approximately 15%. The time to peak plasma concentration (T_{max}) of loratadine and descarboethoxyloratadine was delayed by 1 hour with a meal. Although these differences would not be expected to be clinically important, CLARITIN Tablets should be administered on an empty stomach.

In patients with chronic renal impairment (Creatinine Clearance ≤ 30 mL/min) both the AUC and peak plasma levels (C_{max}) increased on average by approximately 73% for loratadine, and approximately by 120% for descarboethoxyloratadine, compared to individuals with normal renal function. The mean elimination half-lives of loratadine (7.6 hours) and descarboethoxyloratadine (23.9 hours) were not significantly different from that observed in normal subjects. Hemodialysis does not have an effect on the pharmacokinetics of loratadine or its active metabolite (descarboethoxyloratadine) in subjects with chronic renal impairment.

In patients with chronic alcoholic liver disease the AUC and peak plasma levels (C_{max}) of loratadine were double while the pharmacokinetic profile of the active metabolite (descarboethoxyloratadine) was not significantly changed from that of normals. The elimination half-lives for loratadine and descarboethoxyloratadine were 24 hours and 37 hours, respectively, and increased with increasing severity of liver disease.

There was considerable variability in the pharmacokinetic data in all studies of CLARITIN Tablets, probably due to the extensive first-pass metabolism of loratadine. The area under the curve, clearance, and volume of distribution were skewed and the initial distribution on a 25-fold range in distribution.

Loratadine is about 97% bound to plasma proteins at the expected concentrations of 10 to 40 mg. The therapeutic dose. Loratadine does not bind to plasma proteins at concentrations of 10 to 40 mg. The metabolite, descarboethoxyloratadine, is about 97% bound to plasma proteins (at 0.5 to 10 mg).

In studies in rats and monkeys, radiolabeled loratadine and its metabolite, descarboethoxyloratadine, were shown to be readily absorbed and to be rapidly metabolized. The metabolites were readily cross-reacted with guinea pig pulmonary tissue, indicating preferential binding to

of 10 mg, a dose-related increase in the incidence of somnolence was observed. Therefore, some patients, particularly those with hepatic or renal impairment and the elderly, may experience somnolence.

In a study in which CLARITIN Tablets were administered at 4 times the clinical dose for 90 days, no clinically significant increase in the QTc was seen on ECGs.

INDICATIONS AND USAGE CLARITIN Tablets are indicated for the relief of nasal and non-nasal symptoms of seasonal allergic rhinitis.

CONTRAINDICATIONS CLARITIN Tablets are contraindicated in patients who are hypersensitive to this medication or to any of its ingredients.

PRECAUTIONS **General:** Patients with liver impairment should be given a lower initial dose (10 mg every other day) because they have reduced clearance of CLARITIN Tablets.

Drug Interactions: The coadministration of a single 20 mg dose of CLARITIN Tablets (double the recommended daily dose) and a 200 mg dose of ketoconazole twice daily to 12 subjects resulted in increased plasma concentrations of loratadine (180% increase in AUC) and its active metabolite, descarboethoxyloratadine (56% increase in AUC). However, no related changes were noted in the QTc on ECGs taken at 2, 6, and 24 hours after the coadministration of loratadine and ketoconazole. Also, there were no significant differences in clinical adverse events between CLARITIN Tablet groups with or without ketoconazole.

Other drugs known to inhibit hepatic metabolism should be coadministered with caution until definitive interaction studies can be completed. The number of subjects who concomitantly received macrolide antibiotics, cimetidine, ranitidine, or theophylline along with CLARITIN Tablets in controlled clinical trials is too small to rule out possible drug-drug interactions. There does not appear to be an increase in adverse events in subjects who received oral contraceptives and CLARITIN Tablets compared to placebo.

Carcinogenesis, Mutagenesis, and Impairment of Fertility: In an 18-month oncogenicity study in mice and a 2-year study in rats, loratadine was administered in the diet at doses up to 40 mg/kg (mice) and 25 mg/kg (rats). In the carcinogenicity studies, pharmacokinetic assessments were carried out to determine animal exposure to the drug. AUC data demonstrated that the exposure of mice given 40 mg/kg of loratadine was 3.6 (loratadine) and 18 (active metabolite) times higher than a human given 10 mg/day. Exposure of rats given 25 mg/kg of loratadine was 28 (loratadine) and 67 (active metabolite) times higher than a human given 10 mg/day. Male mice given 40 mg/kg had a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) than concurrent controls. In rats, a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) was observed in males given 10 mg/kg and males and females given 25 mg/kg. The clinical significance of these findings during long-term use of CLARITIN Tablets is not known.

In mutagenicity studies, there was no evidence of mutagenic potential in reverse (AMES) or forward point mutation (CHO-HGPRT) assays, or in the assay for DNA damage (Rat Primary Hepatocyte Unscheduled DNA Assay) or in two assays for chromosomal aberrations (Human Peripheral Blood Lymphocyte Clastogenesis Assay and the Mouse Bone Marrow Erythrocyte Micronucleus Assay). In the Mouse Lymphoma Assay, a positive finding occurred in the nonactivated but not the activated phase of the study.

Loratadine administration produced hepatic microsomal enzyme induction in the mouse at 40 mg/kg and rat at 25 mg/kg, but not at lower doses.

Decreased fertility in male rats, shown by lower female conception rates, occurred at approximately 64 mg/kg and was reversible with cessation of dosing. Loratadine had no effect on male or female fertility or reproduction in the rat at doses of approximately 24 mg/kg.

Pregnancy Category B: There was no evidence of animal teratogenicity in studies performed in rats and rabbits. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, CLARITIN Tablets should be used during pregnancy only if clearly needed.

Nursing Mothers: Loratadine and its metabolite, descarboethoxyloratadine, pass easily into breast milk and achieve concentrations that are equivalent to plasma levels with an AUC_{milk}/AUC_{plasma} ratio of 1.17 and 0.85 for the parent and active metabolite, respectively. Following a single oral dose of 40 mg, a small amount of loratadine and metabolite was excreted into the breast milk (approximately 0.03% of 40 mg over 48 hours). A decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. Caution should be exercised when CLARITIN Tablets are administered to a nursing woman.

Pediatric Use: Safety and effectiveness in children below the age of 12 years have not been established.

ADVERSE REACTIONS Approximately 90,000 patients received CLARITIN Tablets 10 mg once daily in controlled and uncontrolled studies. Placebo-controlled clinical trials at the recommended dose of 10 mg once a day varied from 2 weeks' to 6 months' duration. The rate of premature withdrawal from these trials was approximately 2% in both the treated and placebo groups.

REPORTED ADVERSE EVENTS WITH AN INCIDENCE OF MORE THAN 2% IN PLACEBO-CONTROLLED ALLERGIC RHINITIS CLINICAL TRIALS

	PERCENT OF PATIENTS REPORTING			
	LORATADINE 10 mg OD n = 1926	PLACEBO n = 2545	CLEMASTINE 1 mg BID n = 536	TERFENADINE 60 mg BID n = 684
Headache	12	11	8	8
Somnolence	8	6	22	9
Fatigue	4	3	10	2
Dry Mouth	3	2	4	3

Adverse event rates did not appear to differ significantly based on age, sex, or race, although the number of non-white subjects was relatively small.

In addition to those adverse events reported above, the following adverse events have been reported in 2% or fewer patients.

Autonomic Nervous System Altered salivation, increased sweating, altered lacrimation, hyposthesia, impotence, thirst, flushing.

Body As A Whole Conjunctivitis, blurred vision, earache, eye pain, tinnitus, asthenia, weight gain, back pain, leg cramps, malaise, chest pain, rigors, fever, aggravated allergy, upper respiratory infection, angioneurotic edema.

Cardiovascular System Hypotension, hypertension, palpitations, syncope, tachycardia.

Central and Peripheral Nervous System Hyperkinesia, blepharospasm, paresthesia, dizziness, migraine, tremor, vertigo, dysphonia.

Gastrointestinal System Abdominal distress, nausea, vomiting, flatulence, gastritis, constipation, diarrhea, altered taste, increased appetite, anorexia, dyspepsia, stomatitis, toothache.

Musculoskeletal System Arthralgia, myalgia.

Psychiatric Anxiety, depression, agitation, insomnia, paroniria, amnesia, impaired concentration, confusion, decreased libido, nervousness.

Reproductive System Breast pain, menorrhagia, dysmenorrhea, vaginitis.

Respiratory System Nasal dryness, epistaxis, pharyngitis, dyspnea, nasal congestion, coughing, rhinitis, hemoptysis, sinusitis, sneezing, bronchospasm, bronchitis, laryngitis.

Skin and Appendages Dermatitis, dry hair, dry skin, urticaria, rash, pruritus, photosensitivity reaction, purpura.

Urinary System Urinary discoloration, altered micturition.

In addition, the following spontaneous adverse events have been reported rarely during the marketing of loratadine: peripheral edema; abnormal hepatic function, including jaundice, hepatitis, and hepatic necrosis; alopecia; seizures; breast enlargement; erythema multiforme; and anaphylaxis.

DRUG ABUSE AND DEPENDENCE There is no information to indicate that abuse or dependency occurs with CLARITIN Tablets.

OVERDOSAGE Somnolence, tachycardia, and headache have been reported with overdoses greater than 10 mg (40 to 180 mg). In the event of overdosage, general symptomatic and supportive measures should be instituted promptly and maintained for as long as necessary.

Treatment of overdosage would reasonably consist of emesis (ipecac syrup), except in patients with impaired consciousness, followed by the administration of activated charcoal to absorb any remaining drug. If vomiting is unsuccessful, or contraindicated, gastric lavage should be performed with normal saline. Saline cathartics may also be of value for rapid dilution of bowel contents. Loratadine is not eliminated by hemodialysis. It is not known if loratadine is eliminated by peritoneal dialysis.

Oral LD_{50} values for loratadine were greater than 5000 mg/kg in rats and mice. Doses as high as 10 times the recommended clinical doses showed no effects in rats, mice, and monkeys.

DOSAGE AND ADMINISTRATION Adults and children 12 years of age and over: One 10 mg tablet daily on an empty stomach.

In patients with liver failure, 10 mg every other day should be the starting dose.

HOW SUPPLIED CLARITIN Tablets, 10 mg, white to off-white compressed tablets; impressed with the product identification number "458" on one side; and "CLARITIN 10" on the other; high density polyethylene plastic bottles of 100 (NOC 0085-0458-03). Also available, CLARITIN Unit-of-Use packages of 14 tablets (7 tablets per blister card) (NOC 0085-0458-01) and 30 tablets (10 tablets per blister card) (NOC 0085-0458-05), and 10 x 10 tablet Unit Dose-Hospital Pack (NOC 0085-0458-04).

Protect Unit-of-Use packaging and Unit Dose-Hospital Pack from excessive moisture. Store between 2° and 30° C (36° and 86° F).

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Transdermal Scopolamine-Induced Neurologic Deficits in Patients with Cancer

Marc H. Friedberg, MD, PhD
Michael J. Glantz, MD

Headache, mydriasis, cycloplegia, blurred vision, decreased acuity, impaired ocular accommodation, urinary retention, drowsiness, disorientation, and frank psychosis may occur with parenteral or oral scopolamine.

Nausea and vomiting are common problems in patients with cancer. Both the cancer and its treatment are potential causes, creating a diagnostic and a therapeutic dilemma. Physicians frequently must evaluate such patients when there is no obvious explanation for the nausea, when neurologic signs or symptoms accompany the nausea, when known central nervous system (CNS) cancer is present, or when the likelihood of CNS metastases is high. In these situations, antiemetic therapy can interfere with diagnosis both by suppressing some symptoms of CNS cancer (nausea and vomiting) and by producing others (confusion, sedation, and focal deficits). We describe several diagnostically confounding effects of transdermal scopolamine, which is being used with increasing frequency to control nausea and vomiting in patients with cancer.

Case Reports

Case 1: Nine days after subtotal resection of a left parietal lobe glioblastoma multiforme, a 41-year-old man was found to have anisocoria. The right pupil was 7.5mm and unreactive; the left was 4mm and constricted to 2.5mm in direct light. The patient complained of a headache and mild nausea, and his family reported that he fell asleep when not being actively engaged. On examination, a mild right central seventh nerve palsy, slight right pronator drift, mild left-sided neglect, and slowed rapid finger movements in the right hand were unchanged from the preoperative examination. The headache, nausea, and somnolence had developed abruptly while Decadron and mannitol were being tapered. Surgery had been complicated by a small hemorrhage in the tumor bed and significant peri-tumoral edema with mid-line shift. Because of the anisocoria, a CT scan was obtained. There was no change in the hem-

orrhage, tumor mass or surrounding edema, the brainstem appeared normal, and the basal cisterns were open. The patient subsequently volunteered that he had been applying scopolamine patches (obtained previously from another physician for air sickness) behind his ear. This was discontinued. The anisocoria, lethargy and headache resolved within 24 hours.

Case 2: A 22-year-old woman was seen emergently because of a "blown" pupil. Stage I-A nodular sclerosing Hodgkin's disease had been diagnosed in January 1988. Three cycles of chemotherapy and 4000 cGy of chest irradiation were given. In February 1989, an MRI suggested tumor in the L-2 vertebra and a biopsy revealed recurrent disease. From March 1989 to November 1989, eight cycles of chemotherapy were given, but in December 1989 a new soft tissue mass next to the right iliac bone appeared. Biopsy again showed Hodgkin's disease. The patient received radiation to the right pelvis and proximal femur, and in July 1990 she received 4 days of high-dose chemotherapy, followed by autologous bone marrow transplant. Ten days after marrow infusion, the left pupil was noted to be 9mm and unreactive to light. The right pupil was 6mm, and constricted to 5.5mm with direct light. There was no headache, eye pain, diplopia, or decreased acuity. The patient complained of urinary retention and mild nausea. On examination there was a mild left facial asymmetry, areflexia, bilaterally up-going toes, and mild right leg weakness, all old. An enhanced CT scan of the head was performed, but no abnormalities were found. A lumbar puncture yielded acellular fluid, with a normal glucose and protein. On the following day, both pupils were dilated and unreactive, and the patient complained of mild nausea and difficulty reading. A scopolamine patch was discovered behind the left ear. Twelve hours after its removal, the pupillary abnormalities, visual symptoms, and urinary complaints disappeared. The patient was a contact lens wearer.

Case 3: A 24-year-old woman with widely metastatic melanoma was seen because of anisocoria. She had been admitted for

chemotherapy, and had complained for several weeks of mild nausea and for several days of headache and difficulty concentrating on her paperwork. The neurologic examination was normal except for an 8mm, unreactive right pupil. The left pupil was 5mm, and constricted to 4mm with direct light. A CT scan was obtained emergently, and was normal. Two large volume CSF examinations were unremarkable, and no malignant cells were seen. The patient, a contact lens wearer, had previously been given scopolamine patches for control of nausea. She had removed a patch (and inserted her contact lenses) at home on the morning of admission. By the third hospital day, the anisocoria, headache, and difficulty reading had resolved.

Case 4: A 69-year-old man with small cell lung cancer was referred emergently because of blurred vision, mild confusion, and a new anisocoria. The primary tumor had been treated with radiation and combination chemotherapy but had nevertheless metastasized to the liver and thoracic spine. A T-8 epidural cord compression had been irradiated 2 months earlier. On examination, the patient was alert and oriented but complained of nausea and difficulty concentrating for the previous 2 days. The right pupil was 8mm and unreactive; the left was 5mm and constricted to 4mm with a direct light. Extraocular movements were normal. There was a mild peripheral right seventh nerve palsy. The remaining cranial nerves were normal. Deep tendon reflexes were brisk, except that the right biceps and both ankle reflexes were unelicitable. The toes were down-going. There was a mild left foot drop and complaints of tingling over the dorsum of the left foot. The neurologic examination was reportedly normal 7 weeks earlier. The patient had removed a scopolamine patch from behind his right ear before the examination. He also wore contact lens-

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ABBREVIATIONS USED:

CNS: central nervous system

CSF: cerebrospinal fluid

CT: computed tomography

MRI: magnetic resonance imaging

es. The scopolamine patches were discontinued, and 2 days later the blurred vision and anisocoria had resolved. Because of the additional abnormalities on neurologic exam, a lumbar puncture was performed, and malignant cells, consistent with a small cell lung cancer, were seen.

Discussion

The neurologic side effects of cancer chemotherapy are being recognized more frequently as cancer incidence climbs, and more intensive treatment regimens are used. Cytotoxic drugs,¹ corticosteroids,² and narcotic analgesics,³ are commonly implicated when the neurologic examination changes, but frequently used ancillary agents such as anti-emetics are rarely held suspect. Hyoscine (scopolamine) is a competitive inhibitor of muscarinic acetylcholine receptors, and is effective in preventing or ameliorating motion-induced nausea and vomiting.^{4,5} Headache, mydriasis, cycloplegia, blurred vision, decreased acuity, impaired ocular accommodation, urinary retention, drowsiness, disorientation, and frank psychosis may occur with parenteral or oral scopolamine. Transdermally administered scopolamine has a lesser incidence of these side-effects, but all have been reported, and mydriasis, in some cases due to inadvertent finger-to-eye instillation of drug, may be more common with this route of administration.^{4,14} Because of its ease of administration, transdermal preparations have become popular remedies for motion sickness, and are being used increasingly at our hospital and many others for the treatment of chemotherapy and radiotherapy-induced nausea and vomiting.⁵

Several case reports, most in young and healthy adults, have described diagnostic misadventures embarked upon when unilateral pupil dilation, sometimes in association with nausea, suggested serious CNS disease.^{4,14} The use of transdermal scopolamine in patients with cancer is especially apt to create diagnostic confusion. In these patients, new involvement of the CNS or progression of known CNS disease is often heralded by signs and symptoms similar to those of scopolamine toxicity. Headache, nausea, lethargy, and blurred or double vision are common presenting symptoms of increased intracranial pressure.^{15,16} Unilateral pupil dilatation, followed by diplopia, decreased responsiveness, and progressive brainstem dysfunction may occur with temporal lobe herniation.¹⁷ Headache, nausea and vomiting, encephalopathy, diplopia and sphincter dysfunction are frequent early symptoms of leptomeningeal carcinomatosis.¹⁸

In this paper, we present four cases in which new or progressive neurologic signs and symptoms (pupillary abnormalities, blurred or double vision, headache, lethargy, and urinary retention) attributable to the use of transdermal scopolamine patches were instead presumed to have a malignant etiology. In three cases, emergent diagnostic studies were undertaken with negative results. In a fourth case, additional neurologic signs and symptoms suggested the diagnosis of leptomeningeal disease, although the reason for referral was a drug-induced mydriasis. Although unilateral mydriasis can occur without direct instillation of drug into the eye, in three or four patients, the use of contact lenses suggests the former explanation.¹³ The associated symptoms, however, are probably related to systemic absorption of scopolamine. In each case, the use of the transdermal scopolamine was unknown to the physician involved in the patient's acute care, and this information was not provided by the patients despite direct questioning about medications in each case. Patients frequently neglect to report the use of medications that are either in widespread use (aspirin, vitamins), or are felt to be trivial. In three cases, the patch had been removed and forgotten before examination. However, active drug may remain in the patch for up to 2 weeks if left in place, and may remain adsorbed to the skin after the patch is removed.^{4,9} Pupillary dilation may persist for up to 7 days.^{9,11}

Several clinical clues, short of observing the patch, may help in arriving at a correct diagnosis. In each of our patients, both pupils were dilated and slowly reactive, although there was a marked pupillary asymmetry. In most published cases, pupillary dilation has occurred ipsilateral to the patch, but contralateral or bilateral mydriasis is occasionally noted.^{11,13} In no patient was there an abnormality of extra-ocular movement attributable to a third nerve palsy, and in no patient was there marked or progressive impairment in level of consciousness. In one patient, instillation of 1% pilocarpine (a parasympathomimetic agent) failed to produce pupillary constriction. Constriction would be expected in the case of a third nerve palsy. Its absence is typical of acute angle closure glaucoma, trauma or disease of the iris, and chemical blockade of the sphincter muscle of the iris as with scopolamine.^{19,20} Despite these clinical clues, the risk of diagnostic error remains great when transdermal scopolamine is used in patients with cancer. If this possibility is kept in mind, however, it can generally be excluded without recourse to expensive, unnecessary, or dangerous testing.

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Ayurveda: The Hindu Art of Medicine

A. Sattar Memon, MD, FACP

Ayurveda is a prevention-oriented holistic science of natural healing developed about 3000 years ago by the great masters of ancient India. In Sanskrit—the mother of many ancient and current languages—AYUS means life, and VEDA means science. It thus translates to: “A science of long life.” *Ayurveda* accomplishes its goal by treating the disease as well as coordinating the body, mind and soul nexus with the help of a vegetarian diet, herbs, exercise (yoga) and meditation.

Ayurveda arises from a harmonious communion of the spirit of life with the many faces of nature; this is contrary to its image as some antiquated form of herbal folk medicine. It is a way of life lived in harmony with nature. Most of all, it places great emphasis on the concept that the mind leads the body via pathways currently called psychoneuroimmunology. *Ayurveda* teaches us of a fourth state of awareness, a state of ultimate relaxation and recuperation—namely, meditation.¹

Historical Background

According to the *Rishis* (seers of wisdom in ancient India), Lord Brahma gave birth to this science of well-being and healing, designing it so that it might be easily available to the masses of people.

It is said that the *Vedas*, the oldest and most sacred written records of knowledge, were passed on to the *Rishis* by Lord Brahma in four categories (*Rig*, *Yajur*, *Sama* and *Atharva*) in the form of ancient metrical chants. Of the four *Vedas*, *Rig-veda* is the oldest and forms the theoretical foundation for *Ayurveda*.

There are three body-types (or personality profiles) in *Ayurveda*, comparable in some ways to Types A and B in allopathic medicine. The identity of these body types, called *Doshas*, is essential when prescribing compatible diets or specific herbs.²

Within the domain of *Ayurveda* are the two major schools (*Atreya*, school of physicians, and *Dhanvantari*, school of sur-

geons). The names of some of their subspecialties are:

Surgery (*Shalyatantra*)
Internal medicine (*Kayachikitsa*)
Pediatrics (*Kaumarabhritya*)
Psychiatry (*Bhutavidya*)
Sexology, aphrodisiacs (*Vajikarana*)
Rejuvenation (*Rasayana*)

The scholarly *Ayurvedic* writings, many of which have been irretrievably lost, were compiled into texts called the *Samhitas*. Three, older than a thousand years, are still existent in Sanskrit and are called the trio of *Brihatrayi*. The oldest of these three, *Charaka Samhita*, deals with the *Atreya* (internal medicine) school and discusses fundamental physiology, anatomy, etiology and pathogenesis of disease, diagnostic criteria, treatment and prognosis. In addition, it also describes principles of prevention and social behavior conducive to emotional and physical health. There are detailed descriptions of treatments through use of medicinal plants, elimination therapies and rejuvenation measures. Current research, incidentally, shows that *Ayurvedism* increases the circulating level of dehydroepiandrosterone.³ The *Charaka* text, as Sanskrit tradition demands, contains elements of impressive poetry.

Sushruta, the *Dhanvantari* school of surgeons, contains clear and detailed descriptions of instruments and procedures for the treatment of fractures, wounds, plastic reconstruction, abscesses and bowel surgery. Anatomic details and their pathologic alterations are impressively narrated. The science of *Marmas* (vital body points, comparable to acupuncture) is also clearly illustrated.

The *Charaka* and *Shushruta Samhitas* possess a wealth of knowledge, scientific experimentation and research. This body of information was begun more than 2000 years ago at such great Indian centers of scholarly inquiry as Takshashila, Nalanda and Benares, all located in the northern part of the Indian subcontinent, a region known for its environmental diversity.

India ranges in altitude from sea level to the northern mountains towering to 25,000 feet. Some of its territories are rainless deserts while other regions experience, annually, more than 500 inches of rain. This immense climatic variation creates a spec-

Under Buddhism, Ayurveda became an instrument encouraging a great respect for nature, nonviolence and harmonious survival.

tacular diversity of medicinally important plants. According to *Samhitas*, a particular plant is to be cultivated, harvested and processed only at a certain phase of the season so that the desired chemical accumulates to an optimal concentration and purity without adverse interaction from other substances within the same plant.

The great era of Buddhism (323 BC to 642 AD) proved to be a mixed bag of blessings for *Ayurveda*. The Buddhist scholar, Nagarjuna, wrote numerous critical commentaries on *Sushruta Samhita*, and with others, helped to disseminate *Ayurveda* to the general populace. He accomplished this by creating *Ayurvedic* schools and hospitals, and encouraging the planting of medicinal herbs in many of the rural towns and villages. Buddhism became the vehicle that transmitted *Ayurveda* to China and southeast Asia, as well as to the Mediterranean countries. Students from distant lands now traveled to India to learn more of *Ayurveda*. Under Buddhism, *Ayurveda* became an instrument encouraging a great respect for nature, nonviolence and harmonious survival.

Scholars regard the 8th century of the

Buddhism became the vehicle that transmitted Ayurveda to China and southeast Asia, as well as to the Mediterranean countries.

current era as the zenith of *Ayurvedic* medicine. Indian physicians went great distances to provide consultation and the management of local hospitals. Thus, *Ayurveda* spread effortlessly to Indonesia, Malaysia, Indochina, Japan, Afghanistan, Iran and the Mesopotamian plateau. Buddhism, however, was responsible for one fundamental disadvantage to *Ayurveda*. In its strict observance of nonviolence, the art of *Ayurvedic* surgery was neglected and eventually abandoned.

During the 7th century, AD, a scholar named Vagbhatta wrote simplified summaries of *Charaka* and *Shushruta*, combining them into a compilation called *Ashtanga Hridaya*. In Vagbhatta's lifetime this summary had been translated into Arabic and called, then, *Unani* medicine.

During the relentless invasions of India

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by the Moguls (particularly in the 16th century) *Ayurvedism* began to fade. In the succeeding 400 years, the *Ayurvedic* writings of Madhavacharya, especially those concerning the art of diagnosis, helped to revive *Ayurveda* somewhat. During this interval, various *Ayurvedic* texts on alchemy and materia medica were assembled. During the 16th century, a physician named *Bhava-Mishra* wrote an easily read text called *Bhava Prakasha*. In it, he called attention to a syphilis-like disease the appearance of which coincided with the arrival of the Portuguese in India.

The greatest blow to *Ayurveda*, however, came with the arrival of the English who, through conquest, replaced the Mogul and Rajput kings. Any state patronage to *Ayurvedic* medicine was now cut off, while European-oriented competitive schools of allopathic medicine were established. For years, though, the masses of Indians continued to rely upon *Ayurveda*, it being the only form of health care that they could afford. The *Vaidyas* (*Ayurvedic* physicians) firmly believed the *Ayurveda* was divinely created for the benefit of all mankind. By 1920, resentment toward the anti-*Ayurvedism* emerged and the British yielded somewhat by establishing a few *Ayurvedic* medical schools in various Indian states. But it was only when Indian independence was achieved beyond 1946 that national attempts, in retrospect mostly unsuccessful, were made to preserve and disseminate *Ayurvedic* medicine.

During recent decades the educated, and English-speaking, Indian masses found western, allopathic medicine neat, simple and quick. An injection of penicillin was considered to be more convenient and certainly more impressive than the drinking of near-impalatable decoctions of boiled roots and bark; furthermore, this therapeutic simplicity kept them from observing instructions regarding articles of food that might react adversely with the active substances within the herbal mixture. Injections and pills became synonymous with the polished British image of neat western-style clothing, while herbal powders and extracts conjured up the unfashionable image of the country Indian doctor who wore *dhoti* (Hindu loincloth of cotton) and *angarkha* (Hindu half-sleeved shirt), hence appearing half-naked and obviously uncivilized. Mahatma Gandhi attempted to counter this unrealistic and culturally destructive imagery, but before he could make any contribution in this area, he was assassinated. Furthermore, as the obvious advantages of allopathic surgery became apparent, the methods of *Ayurvedism* retreated still more, at least in the larger cities.

In Sri Lanka about 80% of the population still adhere to *Ayurvedic* principles of therapy. A similar fraction of the vast Indian population, mostly the rural element, also abide by the natural, inexpensive and easily available tenets of *Ayurvedism*. And in the United States, the shrine of allopathic medicine, there are now *Ayurvedic* medicine clinics established in Massachusetts, Iowa and California. A recent article in the *New England Journal of Medicine* indicates that at least one-third of Americans currently use at least one alternative (ie, non-allopathic) form of therapy.

The Indian government is now revisiting the historic roots of its indigenous medical therapies. It is noteworthy, also, that there is presently a renewed interest in *Ayurvedic* medicine in certain western countries.

(For a complete set of references, interested readers should contact the author.)

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A Plague in Prostitution: HIV and AIDS in Thailand

Julie Shih

Since AIDS was first identified, we have witnessed its spread from isolated neighborhoods and communities to throughout the world. AIDS did not spread uniformly—it has affected different groups of people at different rates, and in different ways. Such changing dynamics of the disease can be examined in Thailand, where religious, cultural, socioeconomic, and political factors play roles in the spread of AIDS. This paper will explore the AIDS epidemic in Thailand, with a specific emphasis on its well-known sex industry and the related victimization of women. To comprehend the relatively recent phenomenon of AIDS in Thailand fully, one must understand the facilitating cultural context.

Thailand's people predominantly follow Theravada Buddhism, which is a doctrine of responsibility for the individual. Life is perceived to be full of suffering, and the only way to alleviate it is to remove oneself from the matters of this world. The ultimate goal of Theravada Buddhism is enlightenment, known as *nirvana*, a state characterized by a concern only for the spiritual and a neglect for worldly matters. Because this state is difficult to achieve for most people, they aspire instead for rebirth into a better life.¹

To be assured a better life, there is the "law of *karma*," which is the sum of a person's actions; good actions bring merit, *bun*, and bad deeds bring demerit, *ban*. The amount of *bun* and *ban* that a person has had in a previous life determines the amount of suffering they will have in their present life.² An individual's *karma* can be changed by making merit in this lifetime, and the most effective way to do so is to become a monk. Indeed, many Thai boys are ordained, but since the monastery is restricted to males, women are limited in the amount of merit they can accumulate. The most effective ways for women are either to donate money to the monasteries or to "give up" a son so that he can be ordained as a monk. The greater attachment an individual feels for an object, the more merit is gained by giving

that object up.³ These merit-making activities allude to the belief that women are more tied to this world, and thus karmically inferior to men. The reproductive roles of pregnancy and childbirth that women have in society also demonstrate the inherent quality of (physical) suffering in women. Thus being born as a woman shows the presence of bad *karma*, and the ultimate goal for a woman is to be reborn as a man, to come closer to *nirvana*.⁴

Seen in this context, prostitutes are regarded as very low on the cosmological scale for two reasons: they are women, and they come from poor families (wealth is an indicator of karmic status). What merit-making activity can prostitutes do to improve their *karma*? Contribution of money to monasteries and temples is one way, but the way in which such money is acquired requires a look at gender roles in Thai culture, as well as the socioeconomic forces that assign such roles to women.

The major reason women claim for entering the sex industry is their perceived responsibility to provide for their family.

The traditional Thai family has been structured around females, with the power and authority in the family being passed to the senior male in the female line,⁵ and both men and women were expected to be part of the labor force. When the senior male died, the family home was left to the youngest daughter, who was also expected to take care of the parents in their old age.⁶ The 19th century brought a boom in trade, with rice being the primary export. Its agriculture required many laborers who migrated to Thailand, bringing different norms on gender roles. New mores permeated Thailand, spreading polygamy, concubinage, and the practice of having minor wives. Women were subordinated to submissive and decorative roles, relative to the male. Status for males in Thai society was determined not only by wealth, but also by how many wives a man could accumulate; these attitudes and practices continue today. Men aspire to such a status, legitimizing the commercial-

... since HIV has only recently spread to Thailand, it means that relatively few have developed AIDS; this stage of the disease is thus not visible to the population already infected, and so the term "AIDS" carries little or no meaning.

ization and subordination of women.

Most laborers migrating to Thailand in the 19th century were unmarried men, causing the first expansion of the sex industry in Thailand. The biggest expansion occurred in the mid-1960s, due to the presence of American GIs on 5- to 7-day "Rest and Recreation" leaves (R&R, also known as I&I—Intoxication and Intercourse) from the war in Vietnam. Thailand was not too far for GIs to travel from Vietnam, thus maximizing their R&R time. This period saw a dramatic rise in prostitution: "in 1968-69, the number of prostitutes increased 20%, from 151,244 to 182,496."⁷ In 1960, prostitution was declared illegal, but there were no efforts to enforce this law. It continued under the thin veneer of massage parlors, coffee shops, bars, and nightclubs—all in essence, brothels. Prostitution is very much tolerated by the police, as evidenced by the fact that police offer brothel owners protection, in exchange for partial profit from brothels.⁸

When the GIs left the area in 1976, Thailand was already establishing itself as a major tourist mecca, partially to compensate for the loss of money put into the economy by the American soldiers. Tourism attracted primarily Americans, Germans, and Japanese, with the lure of cheap hotels and exotic women.⁹ Travel agencies put together packages specifically for men, with "single men's guides," and itineraries that included "exotic" and "unknown pleasures" with "many girls" waiting in hotel lobbies and coffee shops.¹⁰

Thai men also frequent brothels; the practice of polygamy for males is so sanctioned that every day at least 450,000 Thai men see prostitutes, and at least 75% of Thai men have at some time been with one.¹¹ There is even a custom in Thailand called *ruen pee*, *ruen nung*, in which upperclass males "buy"

ABBREVIATIONS USED

AIDS: Acquired immune deficiency syndrome

HIV: Human immunodeficiency virus

IVDU: Intravenous drug user

R&R: Rest and recreation

STD: Sexually transmitted disease

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prostitutes for younger male students, as a form of initiation or acceptance; refusal to participate results in rejection or being labeled "gay."⁷

The strategy of development employed by Thailand since the 1950s resulted in modernization in urban areas, without much investment in rural areas.³ This created a wide disparity in income between the cities and the rural areas. The quality of land in the outlying rural areas worsened the situation; it consists of mountainous land relying on swidden ("slash and burn") agriculture, with little opportunity for many crops to provide income for a large, hungry family. There was a huge potential to make money in the big cities because labor would be considered relatively cheap by those in the city and the income earned would be immense, relative to rural areas.

Young women migrated to the cities to work in brothels to support their families back home in the rural areas. As mentioned earlier, women were expected to take care of their families, especially in conditions of poverty. Part of the money that female sex workers made was sent home to their families and used to build houses, buy food, provide education for siblings, pay ailing parents' medical bills, and to buy material goods for the family. The major reason women claim for entering the sex industry is their perceived responsibility to provide for their family.⁸ In earning money, prostitutes also have the opportunity to make merit, by contributing some of their income to monasteries and temples.

The modernization of Thai society has also resulted in an increased sense of consumerism and "has served to increase the financial pressures on poor people and possibly also make them more conscious of their relative poverty."⁸ It is widely touted in the media that such materialism is what pushes women into the sex industry, as well as parents selling their children to agents—suddenly, wealth is obtainable to both the rich and the poor for the "mere" price of a daughter.²

The education level of women in rural areas is usually very low, because education is often provided for boys in monasteries, to which girls have no access. Being trained for low-skill jobs in factories is one income option, but it is meager compared to the potential earnings of prostitution. In addition, the physical constraints of working at factories for long periods of time (toxic fumes, poor vision from working with microscopes, etc.) limits the amount of time they can work there. Prostitution is thus an easy and profit-maximizing job for them.

Although rural women are at a disadvantage because of their subordination and lim-

ited access to power, they do not escape the oppression of women. Rather, they take advantage of an economically beneficial opportunity under the constraints of poverty; a religious and cultural system of female responsibility towards the family facilitates and supports this "decision."³

Heterosexual transmission of HIV is now the predominant mode through which HIV is spread.

The first recorded case of AIDS in Thailand was in 1984, in a gay man returning to Thailand, after having lived for some years in the United States.⁴ The rate at which AIDS spread was very slow—3 years later, there were only eight cases of AIDS, and 112 HIV-positive people.⁵ Because AIDS was mostly limited to gay men who claimed to have acquired the disease outside Thailand, the Thai response was of nonchalance, and it was widely believed that the disease was rare and extraneous there. There was even speculation from health officials that Asians had a "natural immunity" to AIDS because so few were infected.⁹

The second phase of the disease changed this, as HIV quickly spread through intravenous drug users (IVDUs), a population of about 100,000 in Bangkok alone. In 1988, it was recorded that there was a cumulative total of about 5000 HIV-positive people.⁹ Health officials began to take notice, and

established monitoring programs, as well as some public health education. This second group of infected persons was still mostly male, but largely heterosexual. This foreshadowed what was yet to come in the third and most recent phase of the epidemic in Thailand, which began in about 1989.

Heterosexual transmission of HIV is now the predominant mode through which HIV is spread, demonstrated by studies that show that between 51% and 91% of infected people in the northern provinces acquired HIV heterosexually.¹¹ With the knowledge of HIV and AIDS in the context of Thai society established thus far, we must now take a closer look at the problem.

The number of sex workers in Thailand (estimated to be somewhere between 80,000² and 1 million¹²) provides an ample pool from which HIV can readily spread, and their customers may range up to 20 a day, for sex workers in brothels in Chiang Mai,⁴ thus allowing for a high rate of spread. Indeed, Dr Vicharn Vithiyasai of Chiang Mai University estimates that HIV was increasing at a rate of 10% a month in the poorest class of prostitutes in Chiang Mai.⁴

There are two generic classes of prostitutes in Thailand: high-class prostitutes who work in fancy massage parlors and go-go bars, and earn more than their low-class counterparts, who see anywhere from 10 to 20 customers a day and earn very little money. There are several reasons for such a

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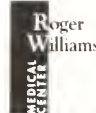
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low income: 1) the brothel owner makes a profit, as does the local police and even politicians; 2) the cost for a sexual encounter is low to supply the demand for them by local Thai men and army recruits; and 3) some women are "bonded" women, who are paying off a cash advance made to their families by brothel agents. It is important to look at these low-class prostitutes in Chiang Mai, because 80% of the Thai population lives in rural areas.¹³ An eye-opening statistic, as studied by Dr Vithiyasai, was that 72% of the low-class prostitutes were HIV-positive. An examination of a few brothels have found that all of its prostitutes are HIV-positive.¹²

Some of the prostitutes working at low-class brothels in Chiang Mai come from the tribal minorities situated in the northern mountains of Thailand (eg, Hmong, Akha, Lisu). The tribes total about 550,000 in number, and their interaction with people of the lowland puts them at risk for HIV infection. The geography of dry, mountainous land where these minorities live makes eking out a living from the soil a difficult one, except for the production of opium. The "Golden Triangle" is an area that encompasses the lands of Burma, Thailand, and Laos, and provides most of the world's

heroin supply. Opium has always been used for medicinal purposes in these tribes, but since economic despair struck the region in the 1970s, many people turned to opium and heroin and became addicts.¹² It is thus easy to see how HIV infection could have spread to the tribes by the IVDU community.

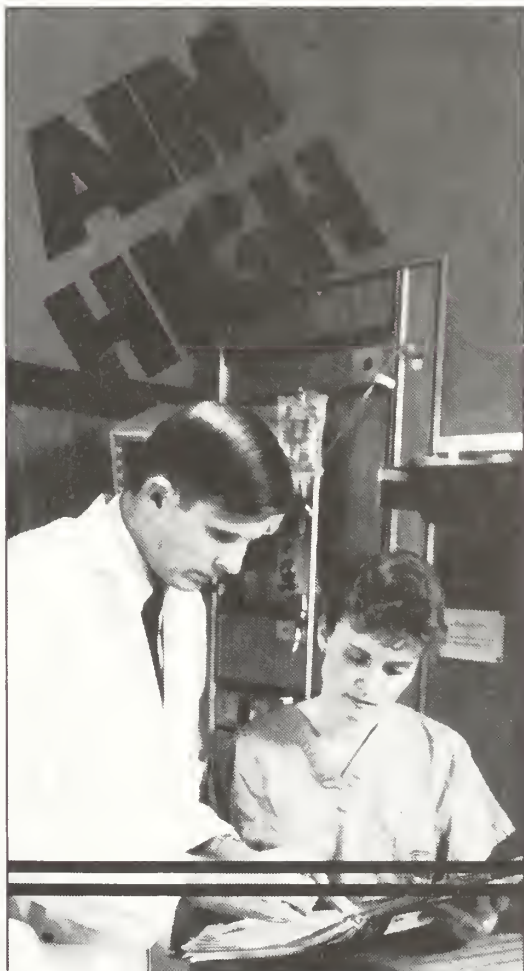
Cultural attitudes that have existed for hundreds of years are difficult to change in a short span of time, even if life itself is at risk.

Despite the easy association of HIV infection in hill tribes with IVDUs, heterosexual transmission of HIV is also a threat to the survival of these ethnic minorities. Pushed into prostitution in much the same way as lowland Thai women are, hilltribe women end up in low-class brothels to support their impoverished families. Hilltribe women have little education, limited command of the Thai language, and no way to access condoms. This lack of control compromises their ability to negotiate condom usage with clients, who may be lowland Thai males who look down upon "dirty and primitive" hilltribe women.¹² Alternatively,

their client may also be a hilltribe male, thus spreading the degree of infection of HIV within hilltribe groups.

It is difficult to disseminate information about AIDS and HIV to these minorities because so little literature is available in their languages. The use of condoms is frowned upon in these societies because of the traditional emphasis on fertility and the production of boys.¹² Just getting such resources (information, education, condoms) out to the mountainous Thai periphery is difficult logistically; the government is less effective in covering these regions in national health education programs on AIDS prevention.

Mechai Viravaidya is the first person who comes to many Thais' minds when thinking about AIDS in Thailand. His award-winning work on family planning with condoms in Thailand was so extensive and so effective that to ask for a condom in Thailand, one asks for "mechais."¹⁰ Viravaidya is spreading information about HIV and AIDS to help stop the rate of infection by using various methods that permeate the daily lives of Thais. For example, he has sent "Mechai Men," dressed as condoms to poor villages, and he has encouraged schoolchildren to blow up condoms as balloons



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for fun. After raising his own money, he employed someone to dress up as "Captain Condom" and infiltrate the Patpong sex district, educating sex workers and their foreign customers on the use and importance of condoms.⁴ Viravaidya has also used mass media to promote awareness of HIV and AIDS; he was able to secure free air time on the military's 126 radio stations and 2 television stations (which reach 60% to 80% of the Thai population). Viravaidya has also brought in economic sectors of society to fight the epidemic: various cosmetic companies distribute pamphlets and leaflets, and the Bank of Agriculture agreed to provide loans to HIV-positive people.¹⁰

All these efforts by Viravaidya make the phenomenon of HIV and AIDS more well known among the population. More people are exposed to the information, allowing for a possibly more comfortable negotiation between prostitute and client regarding the condom use. Yet, cultural attitudes that have existed for hundreds of years are difficult to change in such a short span of time, even if life itself is at risk. A 1990 study by a Thai research company found that 50% of Thai men say they never use a condom, 26% had multiple sex partners in the past 6 months and 86% say that there is only a small

chance of contracting AIDS.⁷ These practices are supported by a Thai saying: "real men box without gloves." Thus, for prostitutes to demand that their clients wear condoms poses a dilemma for both parties. The men do not want to because they will not feel "manly" enough if they do, even if they are aware of HIV and AIDS. The women want their clients to wear condoms to protect themselves from HIV and other STDs, yet if their clients refuse, it presents an immediate economic loss for the women.¹¹ As quoted in Rhodes:⁴ "More than 4000 women work in the Patpong area every night. 'I'm happy if 1 in 10 of my customers wears a condom,' says a bar girl." Such a quotation reveals a common problem of AIDS education: the knowledge is there about how to prevent it, but the actions are not there to put forth the knowledge in motion.

An understanding of the resistance towards wearing condoms for prevention of transmission of HIV can be gained by examining the cultural and religious forces that determine this behavior. There is the folk belief in *siang durang*, which means "taking your fate."⁸ Risk-taking behavior and its link to karmic fate are obvious, according to a source in Rhodes:⁴ "They

don't insist on condoms. How could they? In any case they're Buddhists—they believe in reincarnation. If they get AIDS, it's fate and maybe next time they won't have to come back as a bar girl in Bangkok." Rhodes goes on to cite Mulder, in commenting about merit-making, destiny, and suffering, in the context of Buddhism:

The indigenous Thai boys can be told about AIDS, but (in the Buddhist scheme of things) life is unpredictable. To count on something is to invite a deeper suffering. There is no sense planning, which is a way of becoming attached to a certain future. Attachments simply lead to heartbreak. Desires are transient and one should not be attached to people or things since this leads to suffering. How can they turn down an opportunity now, even involving unsafe sex, when the danger is in the unknown distance and their mother needs the money now?⁴

With this in mind, it is easy to see why Thais often reject using condoms to prevent AIDS. Infection lasts for nearly a decade before AIDS sets in and debilitates; why then should a Thai worry about that future prospect? The necessity to meet immediate economic needs supports this belief. Also, since HIV has only recently spread to Thailand, it means that relatively few have de-

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veloped AIDS; this stage of the disease is thus not visible to the population at risk or the population already infected, and so the term "AIDS" carries little or no meaning.

It has been postulated by Ford and Koetsawang that upon learning of their HIV-positive status, sex workers may simply move on to another brothel to avoid requests for testing by brothel owners or local health authorities. They also have reasoned that seropositive sex workers are less likely to fear infection, so they are less likely to insist on using condoms with clients, especially when offered more money to do so.⁴

The "Golden Triangle" is an area that encompasses the lands of Burma, Thailand and Laos, and it is from here that most of the world's heroin supply comes from.

By placing the AIDS epidemic in the Thai cultural context, its spread in Thailand is understood. The intersection and interplay of religious, cultural, political, and socioeconomic forces that shape the epidemic are complex. These influences must be recognized by government officials, non-governmental organizations, and all those involved in promoting awareness to realize the mass education and mobilization necessary in preventing the spread of HIV.

The majority of HIV-infected people are young, productive contributors to society; as the years go by and they develop AIDS, what will happen to other segments of the population? Parents will have no more daughters to sell their bodies for them, and young children must then rely on care from grandparents. Such a breakdown in the family structure is already being witnessed in Africa, as the number of children orphaned by AIDS continues to grow. What we see of the AIDS epidemic in other parts of the world should give Thailand fair warning of the dangers and disasters that lie ahead if immediate, effective action is not taken.

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From Another Perspective

A Piano Lesson

James E. McLennan, MD

There are only a handful of themes in all of literature. Stories are woven from *tema con variazione*, while others are based upon a recurring sonata form, with gigue or a rondo occasionally added for seasoning. The best stories are about people in groups of one, two or three. Beyond this it gets too complicated to develop meaningful interactions. Endings may be predictable or unexpected. Commonly, authors and audiences alike may devise multiple endings to adapt to their emotional experience.

Jane Campion, in her remarkable new movie, *The Piano*, has created a heroine with unmistakable roots in Tess and Hester Prynne, reaching climax and resolution, however, with Ahab at the bottom of the deep sea. Even more remarkable than the literary product of this writer-director, however, is the total inability of most reviewers to latch onto what she is writing about. Both men and women reviewers, to beat a dead horse, "Just don't get it!" This movie is no more about love than Ms Campion's *Sweetie* was a comedy. When the subject, as described by generations of women writers, is incest and its consequences, it becomes widely suppressed or misinterpreted; at a gut level, people are unable to grasp its essence. If there was a woman who left the theater without feeling like a piece of meat, or for that matter a man who felt that he had just witnessed a love story or even some sort of sexual accomplishment, they were in the wrong movie. Nobody wins in this story; nothing is resolved. We are looking at "the way it is" and the way it always has been. Locked bathrooms in the Wellesley dining hall do not cure bulimia. Calling this a love story is an additional insult to women who

know that violation has occurred.

Ada (played by Holly Hunter), we are told, suffered a major shock at age 6 and has been mute since, speaking only through her daughter (little Pearl) or her piano. The child was allegedly, although we suspect otherwise, the offspring of a brief but marvelous affair (the "Lenny and George" story), which is the only joyful link between mother and daughter.

What might be the source of Ada's mutism? In current psychological terms, we are viewing post-traumatic shock, a severely wounded woman, the result of unimaginable and repetitive wounding of her psyche while in a position of powerlessness. Although, in some sense, this is an evolving discipline, it is also as old as mankind: Its two principal sources are war as well as childhood physical and sexual abuse.

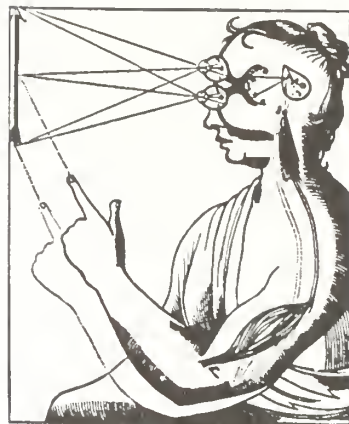
Ada's father sold her into slavery after enslaving his daughter to him forever at age 6. She arrives on the beach in New Zealand as a bartered bride and immediately becomes the meat, the sustenance, in the lives of two pathetic men. Her soul (the piano) is left on the beach but for some reason is not washed away by the gigantic surf. This piano has staying power, although it will ultimately reach a watery, and finally peaceful, death. The climax comes (followed, in my opinion, by a weakening epilogue) when Ada is hurled out of the longboat (Maori canoe) by intentionally entwining her foot in the line pulled out by the sounding whale (the piano). This classic story of a Nantucket sleighride would have delighted Melville and Hardy. Hawthorne would have wept. The whale always wins.

I do not want to dwell further on the greater themes of this marvelous movie, but would like to express my resentment, from a man's viewpoint, regarding the idea presented by many reviewers that love, conquest or "growth" occurred. Both men in this film were rejects of society by fact of being colonists, essentially at the mercy of the Maoris. Keitel's character, an illiterate,

pathetic loser, has tattooed his face in Maori fashion and taken Maori wives in an attempt to fit in somewhere. Neill's character, obviously well read judging from his books and demeanor, is severely repressed sexually (perhaps with origins similar to Ada's problem), possessive, abusive, while appearing to be victimized by Ada who will not love him. Keitel's character also demands love. It has been played out many times before between two men: wild games around the issues of honor and survival; the woman is totally unnecessary, but if she is available as the bartered goods then a somewhat more interesting triangle (a third theme) results. To see anything attractive about either of these men is, for me, very difficult.

This is, of course, Ada's story. She caresses both men with the same movements that the director has explicitly shown to be the essence of her relationship with her piano. She is bringing them in as bits of her fate; they are her pawns. If I were to write an ending to this story I would have had the Maori behead the two men as Ada was escaping to the bottom of the sea. Fortunately, Ms Campion's touch was somewhat more subtle and, it turns out, provides a critical feature of the generational connection of incest. I do not believe that men can understand what, in this regard, women know intuitively; and for this I rely upon my wife's prescience. The child had to be protected; the mother could not yet give in to her deepest desire (suicide). She will eventually try to talk with a bag over her head—but never as a whole woman. The camera lingers over the child asleep beside the man, the displaced Maori wife on the floormat, and Ada's cadenza is complete.

Ms Campion has presented a master class. Do not mistake this as a love story. For the women in the audience, when you get that feeling of revulsion deep in the gut, pay attention. You are responding to a generational plague and the feeling is real. Although we are not all abusers, men should feel a collective shame.



James E. McLennan is a practicing neurosurgeon and a clinical associate professor at Brown University. His office address is One Randall Square, Providence RI 02904

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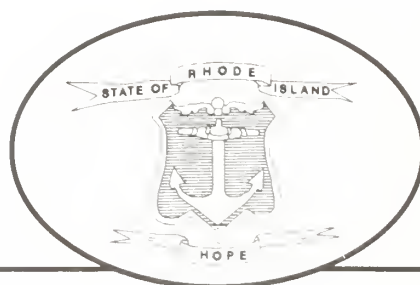
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HEALTH BY NUMBERS



Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

The Health of Rhode Island's Hospitals

Rhode Island's hospitals have become a \$1 billion industry, employing more than 16,000 persons and investing an average of more than \$50 million annually in new capital, including construction and equipment. To track and analyze the need for this investment and the expansion of services, the RI Department of Health maintains a financial and operational database to assess and monitor hospital performance in these areas.

Table 1 presents selected elements from the audited financial statements of the state's 14 community hospitals for fiscal years 1990 through 1992. (Hospital fiscal years (FY) are from October 1 to September 30.) Community Hospital (formerly Cranston General Hospital) closed in FY 1993.

Ratio analysis, a technique adopted from the business community, presents a wealth of information in an easily understood format and allows for meaningful comparisons of different institutions, both locally and nationally. Table 2 provides selected ratios based on the aggregate data in Table 1. The rightmost column in Table 2 indicates the desired trend for each measure over time.

Although trend analysis has considerable utility, it is also necessary to compare local activity with a reference cohort of hospitals to gauge performance. Below is a general overview of how Rhode Island hospitals compared to hospitals nationally in 1992, the most recent year for which such data are available. Each measure presented is a median for the specified cohort of hospitals, (ie, 50% of the hospitals in each cohort were above the median and 50% were below).

It should also be noted that significant changes to Rhode Island's hospital system have occurred since FY 1992. Closure of Community Hospital, bed reductions at Newport and Westerly Hospitals, and the inauguration of the Hasbro Children's Hos-

pital are among such recent developments. In addition, the announced consolidations of Miriam and Rhode Island Hospitals and of Landmark and Memorial Hospitals, the opening of the new Rehabilitation Hospital of Rhode Island on the former Fogarty Hospital premises, and other proposed joint ventures and affiliations will continue to affect the hospitals.

Utilization

Rhode Island's hospitals generated more

money than the national median from each dollar invested in assets—the state median "Total Asset Turnover" (1.20) was the 6th highest in the nation (median 1.02). This was true in part because they were more heavily used (RI's 68.9% "occupancy" was the 5th highest in the US (51.8%)). However, the high utilization was linked to longer hospital stays and not to greater admissions, as the state's 6.9 day "Average Length of Stay" was the 5th longest in the country (5.9). Longer stays may have been warrant-

Table 1.—Selected Aggregate Financial* and Operational Data, Rhode Island Acute-Care Hospitals, Fiscal Years 1990-1992

Source of Indicator/ Indicator	FY90	FY91	FY92	91-92 Change
Balance Sheet				
Cash and Securities	\$45.3	\$73.6	\$91.1	24%
Net Patient Receivables	\$153.0	\$180.6	\$176.6	-2%
Net Fixed Assets	\$365.0	\$377.1	\$407.0	8%
Accumulated Depreciation	\$308.6	\$341.7	\$367.2	7%
Total Assets	\$795.9	\$943.4	\$1,014.5	8%
Current Principal Payment	\$8.4	\$7.4	\$8.5	14%
Current Liabilities	\$156.4	\$187.7	\$213.0	13%
Long Term Debt	\$167.1	\$233.6	\$238.0	2%
Profit & Loss Statement				
Net Patient Revenue	\$853.6	\$933.6	\$1,011.4	8%
Total Operating Revenue	\$911.9	\$991.7	\$1,075.5	8%
Interest Expense	\$15.2	\$15.0	\$14.1	-6%
Depreciation	\$34.2	\$37.0	\$40.3	9%
Wages & Salaries	\$477.8	\$507.1	\$545.8	8%
Total Operating Expenses	\$914.9	\$990.3	\$1,065.5	8%
(Inpatient Expenses)	\$664.0	\$726.9	\$774.5	7%
Net Operating Income (\$3.0)	\$1.4	\$10.1	620%	
Net Income	\$12.6	\$19.6	\$21.3	8%
Other				
Licensed Beds	3,518	3,518	3,518	0%
Patient Days	968,373	942,367	925,405	-2%
Discharges	129,498	131,802	134,545	2%
Unrestricted Endowment (at Market Value)		\$330.6	\$381.6	15%
Restricted Endowment (at Market Value)		\$172.5	\$171.9	-0%
*Dollar amounts in millions				

Submitted by the Office of Health Systems Development, Bruce Cryan, MBA, MS, Health Economics Specialist, John X. Donahue, MPA, Chief. Health by Numbers is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.

ed because Rhode Island patients were more likely to be seriously ill (the 1.252 "Medicare Case Mix" was the 16th highest in the US (1.203)).

Liquidity

Rhode Island hospitals had slightly less liquid cash to meet operating expenses than the national median (the 22.3 "Days Cash on Hand" was the 22nd lowest in the nation (22.4)), and they were slower in collecting their revenue (RI's 72 "Days in Accounts Receivable" was the 15th longest in the US (67)). The associated cash flow squeeze may have caused them to take longer to pay their bills (the 70-day "Average Payment Period" was the 4th longest in the country (56)).

Capital Structure

Rhode Island hospitals had less debt and were not as highly leveraged as was true nationally (the 53.6% "Fixed Asset Financing" measure was the 22nd lowest in the US (58.9%)), but they were less able to service the existing indebtedness (RI's 2.7 "Debt Service Coverage" ratio was the 8th lowest in the nation (3.2)). Also, the requirements of health care reform may alter the patterns of health care capital investment away from replacement of existing inpatient facilities (the "Average Age of Plant" of 9.5 years was the 3rd oldest in the country (7.8 years)).

Profitability

Rhode Island hospitals are relatively expensive on a per-stay basis (the \$5,340 "Cost per Discharge" was the 16th highest in the country (\$4,807)), but not very profitable (RI's 0.5% "Operating Margin" was the 6th lowest in the US (2.7%)). Costs are high in Rhode Island not because of low productivity (the 4.56 "FTEs per Occupied Bed" ratio was the 17th lowest in the US (4.65)), but partially because of high market wages (RI's \$33,633 "Salary per FTE" was the 5th highest in the country (\$26,517)).

In summary, RI hospitals are highly utilized to serve an acute patient population in a high-cost market area. Cash flow is tight, and services are expensive, but the capital-related fixed costs (interest and depreciation) are low compared to other areas. Profitability is weak but improving, and the hospitals enjoy significant community support in terms of contributions to further the goal of providing acute health care for all Rhode Islanders (Figure 1).

Data Sources

1. Rhode Island: Audited financial statements, Rhode Island Department of Health.
2. United States: *The 1993 Almanac of Hospital Financial & Operating Indicators*, The Center for Healthcare Industry Performance Studies.

Table 2. Selected Aggregate Financial and Operational Ratios, Rhode Island Acute-Care Hospitals, Fiscal Years 1990-1992

Type of Ratio/ Ratio	FY90	FY91	FY92	Desired Trend
Liquidity				
Days Cash on Hand	18.8	28.2	32.4	Up
Average Payment Period (Days)	65	72	76	Neutral
Days in Accounts Receivable	65	71	64	Down
Capital Structure				
Age of Plant (Years)	9.0	9.2	9.1	Neutral
Capital Expense	5.7%	5.5%	5.4%	Down
Fixed Asset Financing	45.8%	61.9%	58.5%	Up
Debt Service Coverage	2.6	3.2	3.4	Up
Activity				
Occupancy Percent	73.8%	71.7%	70.3%	Up
Total Asset Turnover	1.17	1.07	1.07	Up
Profitability				
Operating Margin (Percent)	-0.3%	0.1%	0.9%	Up
Operations				
Ave. Length of Stay (Days)	7.3	7.0	6.7	Down
Salary Per FTE	\$30,511	\$31,978	\$33,875	Down
Cost Per Discharge	\$5,128	\$5,515	\$5,756	Down
FTEs Per Occupied Bed	4.31	4.56	4.64	Down

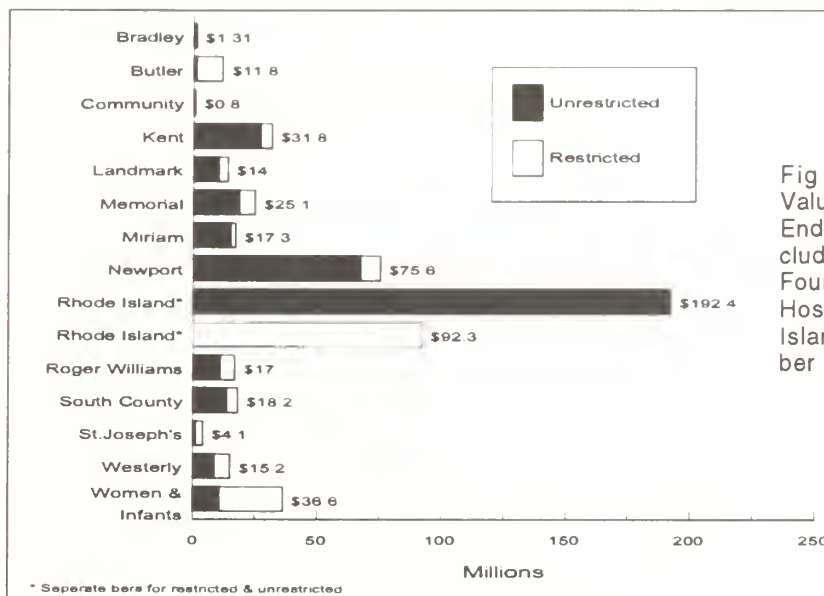


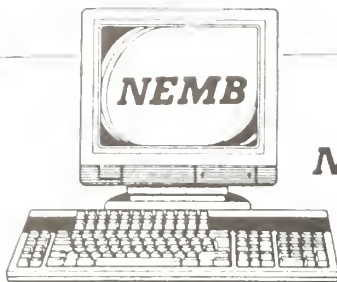
Fig 1.—Market Value of Hospital Endowments (Including Affiliated Foundations), by Hospital, Rhode Island, September 1992.

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THE RHODE ISLAND MEDICAL JOURNAL

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Issued Monthly under the direction of the Publication Committee

VOLUME I
NUMBER 1

PROVIDENCE, R. I., JANUARY, 1917

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (May 1904)

The lead editorial urges that the state of Rhode Island assume responsibility for the care and education of its feeble-minded. "Viewed from any standpoint, criminal, humane, financial, social or educational, it is perfectly evident that the state should take the earliest possible means of developing a school for this class of citizens."

A second editorial decries the noise and danger that accompanies Fourth of July celebrations. The editorial states: "Show the public year by year the uselessness of noise, an array of mutilations, a list of deaths, and the public replies year after year with torpedoes and dynamite crackers. Appeals to patriotism are fruitless, the public blow off their own fingers and put out their eyes in demonstration of patriotism."

The lead article provides a comprehensive review and analysis of "Education of the Feeble Minded," written by William F. Gleason, MD. The author first notes with pride: "The City of Providence has the acknowledged reputation of being the first city in this country to devote itself to the special education of the mentally deficient. These schools provide, however—and, as yet, in an incomplete manner—only for the brightest class of the mentally deficient." He adds, "But it is a lamentable fact that the weak and unfortunate driftwood of our communities, those upon whom are afflicted the sins of our forebears, and who should be our manifest care—handicapped as they are from birth or because of accident or disease—are still dependent upon such poor attention as they may obtain, often so situated as to be unable, or unwilling, to provide for them."

He observes, further: "We cannot solve the problem off-hand. We must first learn from our medical inspection the number of pupils who will come under the class with

which we are dealing." Based upon the 1900 US census data, the author estimates that there are 100,000 feeble minded in the United States and, conservatively, about 800 currently living in Rhode Island.

The author then describes in detail the experiences accumulating in other states (particularly in Massachusetts) with the creation and management of residential communities (ie, state institutions for the feeble-minded) in rural settings. He is particularly impressed with the work of Dr Fernald, superintendent of the Massachusetts School for the Feeble-Minded. After a meticulous description of these many state-run facilities, he concludes: "I have not gone into the broad subject of the care of all feeble minded. My idea is not to invite the State or the city to furnish a new dumping ground for the absolutely helpless—but rather to improve those capable of improvement, on broad educational lines—to the evident mutual satisfaction of the City, the State and the afflicted."

50 Years Ago (May 1944)

The lead article discusses newer developments in the clinical and laboratory aspects of lymphogranuloma venereum and is written by Charles H. Mann, MD, DrPH. The author defines the disease as a "wide-spread communicable disease usually acquired venereally. It is caused by a specific filterable agent which can bring about infection in certain experimental animals." He observes further: "It is probable that the disease is much more common than is generally supposed, and perhaps more benign, with a natural tendency to spontaneous cure."

The history of this disease extends back to the 18th century when John Hunter described buboes that were probably not luetic (since they did not respond to mercurial therapy). The disease was felt to be caused

by "climatic influences, chiefly tropical" but the German navy, in 1912, observed that supervised midshipmen, in tropical ports, never contracted "climatic bubo" while those unsupervised readily came down with the disease, thus suggesting that it was communicable and probably venereal. Early histopathologic studies of the involved nodes, erroneously linked the disease with Hodgkin's disease, hence the term, "lymphogranuloma." In 1925, Frei introduced a specific skin test (using an antigen derived from purulent buboes). In the subsequent two decades, the skin-test antigen was further refined, ultimately using an antigen extracted from embryonated chick egg cultures of the agent.

In terms of etiology, the author believes that the causative agent, while filterable, is otherwise distinguishable from other viruses; furthermore, it seems closely related to the agent(s) causing psittacosis, trachoma, inclusion conjunctivitis, atypical pneumonia and, possibly, acute meningo-pneumonia. Finally, the author details the clinical progression of the disease, its complications, its epidemiologic features (including incubation interval) and the many compounds historically used for its treatment (antimony, tartar emetic, arsenic preparations, iodine, topical balsam of Peru, medicinal enemas—and recently, sulfonamides).

Orlando F. Smith, MD, describes the operation of a blood transfusion service in a small hospital. In the past 6 years, he has supervised more than 2000 transfusions with no deaths and with but 4% transfusion reactions (national average, over 6%). The author shares his techniques for reducing transfusion reactions as well as obtaining the needed donors.

Calvin M. Gordon, MD, an intern at Rhode Island Hospital, summarizes a recent speech by Dr D.G. Anderson, on the new agent, penicillin. He concludes: "Just how far this drug is going to go toward curing otherwise incurable diseases it is

hard to say. However it seems fair to say that once the production of this drug has reached more than the "pilot plant" production and when it is available for civilian use, many cases which do not respond to sulfonamide treatment will be found to be cured or at least greatly helped by penicillin."



Editorials in this issue cover a wide range of topics including the recently established Charles V. Chapin Oratory, the prescribing of luxury items during a time of wartime rationing, the establishment of a state rehabilitation center, proper teeth and diet, and the care of the tuberculous veteran.

The program of the 133rd Annual Meeting of the State Medical Society lists such nationally renowned speakers as Walter C. Alvarez, MD, Reginald Fitz, MD, and Richard B. Cattell, MD.

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25 Years Ago (May 1969)

John N. Fain, PhD, writes on proinsulin, obesity and diabetes mellitus. He notes that an interesting aspect of diabetes is the large fraction of the population carrying the gene for this disorder. "The presence of such a large number of individuals who are heterozygous for diabetes and the high death rate of individuals homozygous for the diabetic genes suggest that the heterozygous state had some adaptive advantage at one time over unaffected individuals. No one knows what the adaptive advantage of the individual heterozygous for diabetes was, but it is clearly a condition which no longer exists. Neel has postulated that the diabetic genes are thrifty genes that might have aided primitive man in his adaptation to a life of feast or famine."

David M. Kipnis, MD, writes a paper discussing whether diabetes begins with insulin resistance. He concludes: "Even though impaired insulin secretion may represent an essential component of diabetes, it is obvious that other inherited and environmental factors must also be included in any concept of the pathogenesis of the disease."

A system establishing an objective, quantitative evaluation system of industrial limb or hand disability is described in detail by Henry M. Litchman, MD. The author summarizes: "The total impairment in the case of the hand is the sum of impairment values for the three specific functions of the hand, taking into consideration structural loss, sensory disturbances, and discrepancy in synergistic activity. With this proposed system, direct values can be obtained with a minimum number of charts and tables."

Arnold Porter, MD, provides an annual report of the Physicians Service of Rhode Island (Blue Shield).

Editorials comment of the hazards of piercing of ears (for purposes of earrings), spiritualism, air pollution and the need for further control measures, diabetes mellitus, and adjuvant chemotherapy in the surgery of breast cancer.

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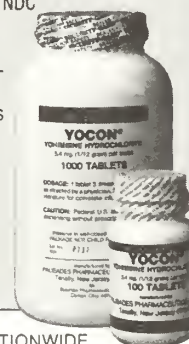
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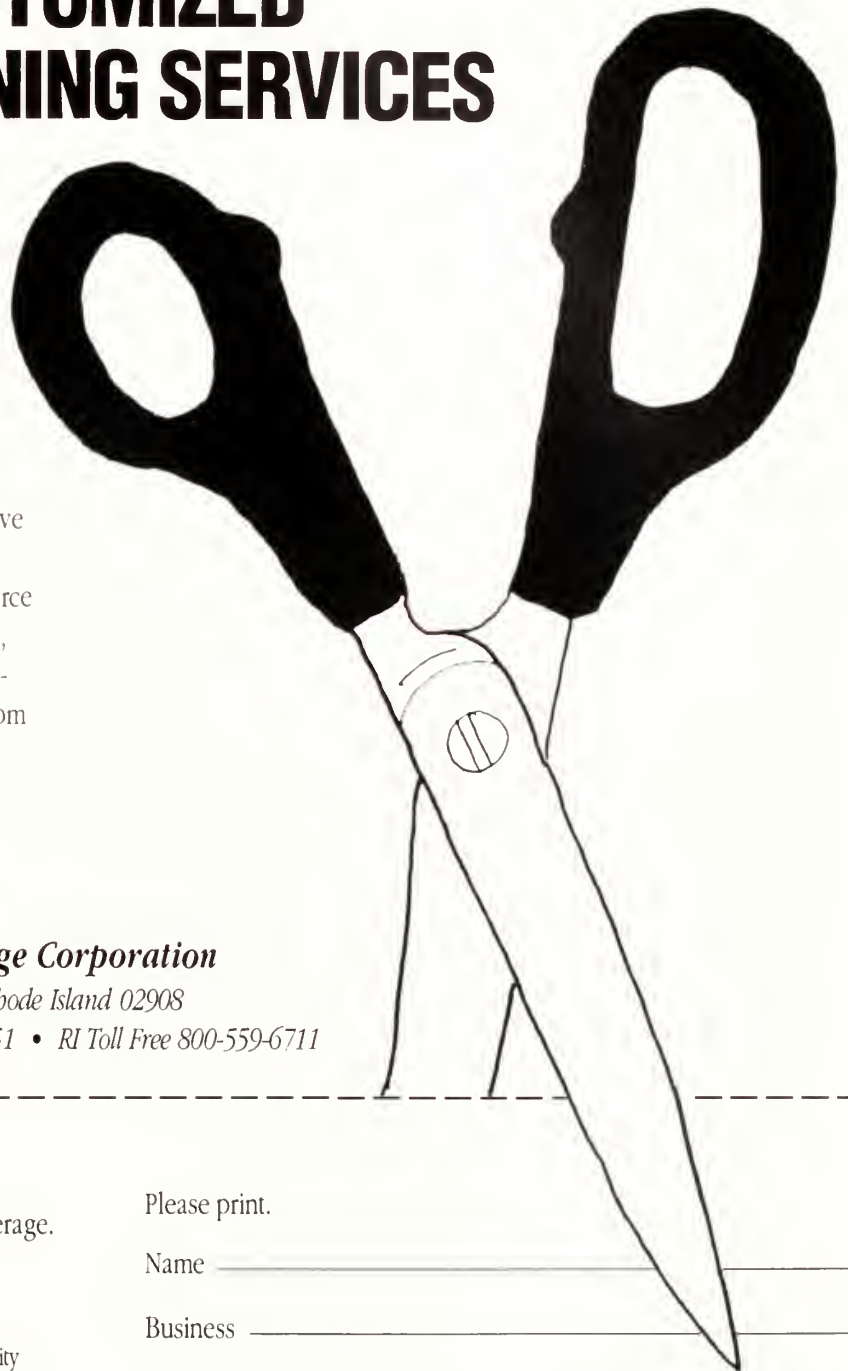
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Medicine in the Year 2018: Visions of the Future

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A Hesitant Look at the Future

Predicting the future is risky business. Unwritten speculations can later be rephrased, recanted or even denied; but something in print will persist indefinitely as an undigested, often imperishable embarrassment. If ultimately you are shown to be wrong, you will then appear foolish. Worse, if you are shown to be correct, you will then be held to blame for somehow encouraging the realization of the events you had predicted.

Despite these hazards, prognostication is still close to every physician's heart. Predicting a clinical course is part of the business of medicine; but predicting the very future of medicine itself is not exactly a required course in medical school. In this issue, we nevertheless offer guesses, which, like occasional lottery tickets, are often bits of benevolent foolishness. Yet with all the mistakes, we persist in forecasting the years in front of us; after all, that's where we will live the remainder of our lives.

Why, for this issue, was 25 years into the future chosen? Why not 5 or 500 years? By epochal standards, of course, 25 years is not an immense leap into the future; rather, it is just next door, a mere geologic heartbeat away. The year 2018 (ie, 25 years after the time of invitation to the prospective authors) was specifically selected as a date sufficiently removed from the present. Still it was within the professional lifetimes of our younger colleagues to warrant that one or more of them may check the accuracy of these published speculations someday. As further instructions to the authors, we limited their thoughts on the future of medicine to no more than eight or so typewritten pages. Wherever possible, they were to be written in the first person, singular. Outrageous views and formats were encouraged.

Why were leaders in various clinical fields chosen rather than members of the medical rank and file? Frankly, power over

the present is a potent element when seeking people who might predict the future with some accuracy. It is easier to envision the events on Thursday, for example, if you exercise control over things on Tuesday (a phenomenon sometimes called a self-fulfilling prophecy). When it comes to forecasting the near future, a chief of a clinical service is more likely to be accurate than, say, one of his junior residents—largely because the chief's position provides him with a broader picture of contending forces, and because Tuesday's decisions, often reached in camera, customarily get translated into Thursday's realities. From Tuesday to Thursday is certainly not 25 years, but the cumulative experience, the authoritative vision, the access to privileged information and the control over operative buttons makes it more likely that the senior physician will come closer to a credible forecast.

Thucydides claimed that any interpretation of the future necessarily required an exact knowledge of the past; probably true to some degree—but he was a professional historian and what else would you expect him to say? This contention that future history was nothing more than the past, artfully rearranged, reached its height in the writings of LaPlace who envisioned, somewhere, a secular intelligence so vast that it could absorb and analyze all data, embracing "... in the same formula both the movements of the largest bodies in the universe and those of the lightest atom; to it, nothing would be uncertain, and the future as the past, would be present to its eyes." These deterministic views were published in 1820 at a time when people believed firmly in the infinite perfectibility of man and his machines, and when stochastic uncertainty was a mere phrase rather than a scientific reality. Still and all, each day does carry some seeds of tomorrow's events; but overall the comfortable, staid linearity of the past seems now to be replaced by an increasingly chaotic, near-random series of quantum alterations that defy simple pre-

diction. Divination is just not what it used to be.

The 10 essayists did not readily accept invitations to write on the future of medicine. Many said they preferred chewing on broken glass. But once into the project, they became enthusiastic and their contributions in this issue of RHODE ISLAND MEDICINE are deftly composed, humorous, and intriguing in their unexpected visions. Future history, these authors realized, is not destination but rather texture and vector. A few of these essays, beneath their rhetorical panache, paint a somewhat grim picture of a medical profession, reduced in size and squeezed into a tertiary care corner, with the daily care of the patient increasingly given—by circumstance or decree—to paramedical personnel. Tomorrow, it needs to be emphasized, is neither here nor is it yet implacably determined. Hence portraits of the future, like these 10 essays, are sometimes presented to provide us with an interval to reflect and things to reflect upon—as well as time to change, rather than merely to sit on the clinic floor and bemoan our future. If we know that it will rain next Thursday, we now have the opportunity to invent the umbrella. In any case, let us not be prematurely disgruntled with this envisaged future. At the very least, give it a chance, perhaps through prophylactic interventions, to absolve itself of our worst Orwellian portents.

Does RHODE ISLAND MEDICINE also have a vision of the future? It will be that glorious age when AIDS is curable, malpractice lawsuits a nightmare of the distant past—and all tissue biopsies come back as benign.

Stanley M. Aronson, MD

The Miraculous Willow Tree

In 1638 the wife of the Spanish governor of Peru, the Countess of Chinchon, was taken gravely ill. The treatment provided for her—a decoction made from the bark of a local tree—was admittedly a desperate

measure. This new therapy succeeded, however, and the news of the suppression of her quotidian fevers spread to Spain and beyond. In time, her name was given to the family of trees (*Cinchona*) from which this unique bark came. The medication rapidly became a popular therapy in the Old World, not only for malaria but for all manner of agues, intermittent, relapsing or hectic. Its rapid dissemination in Europe was accomplished by the Jesuit brotherhood (and hence its alternate name, Jesuit bark). The essential alkaloid within the bark was called *quinquina*, or in English, quinine.

By the 18th century, the supply of this rare and expensive antipyretic was near exhaustion. The natural habitat of the cinchona trees was confined to the Andean wilderness of Peru, Ecuador, Bolivia and Colombia; furthermore, the bark was difficult to harvest because these trees grew singly or in widely separated clusters. Wasteful bark collection techniques finally led to perilously diminished numbers of cinchona trees. Numerous European governments then undertook to transplant young cinchona saplings (particularly *C. succirubra*) to sites more suitable for the economic harvesting of the red bark. By the mid-19th century, cinchona trees had adapted admirably to their new locations and immense stands flourished in India, Ceylon and Java becoming, for a while, the main source of quinine. Quinine was synthesized in 1944 thus eliminating the need for the cinchona farms of Asia.

The interval of quinine scarcity in the 18th century encouraged European naturalists to seek substitutes for the cinchona tree. They tested the barks—and other elements—of many local trees looking for quinine-like substances. In 1757, the Reverend Edward Stone, an Oxfordshire clergyman with an intuitive gift for clinical trials, joined the quest for botanical febrifuges. The bark of the English willow tree (*Salix alba*) impressed him with its intensely bitter quality, reminiscent of the taste of the prohibitively costly Peruvian bark. For 6 years he tested the effects of willow bark extract upon a variety of fevers and on April 25, 1763, he submitted his comprehensive findings to the Royal Society. ("There is a bark of an English tree which I have found by experience to be a powerful astringent, and very efficacious in curing aguish and intermitting disorders.")

A half century later, Buchner, in Germa-

ny, isolated an active glucoside from willow bark, calling it salicin (after the willow genus *Salix*). In 1838, further labors by the chemist, Piria, culminated in the purification and identification of salicylic acid as the antipyretic element within salicin.

Yet other plants were now tested and it was found that bark from the *Spireae* family of shrubs (meadowsweets) also yielded an oil containing salicylates.

The German chemists called this *Spirsäure* (ie, the acid from *Spireae*). The methyl ester of salicylic acid (called oil of wintergreen) was isolated in 1844.

Purified salicylic acid proved to be somewhat toxic, but its sodium salt was found to be more readily tolerated by mouth and effective in suppressing fevers as well as the

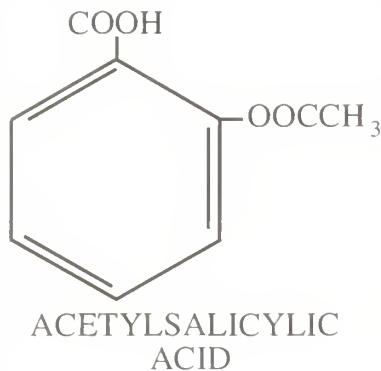
symptoms of acute rheumatism. But even sodium salicylate produced sufficient side effects to justify the continuing search for more acceptable salicylates. Felix Hoffman, an organic chemist at the Bayer factory in Germany, tried acetylsalicylic acid on his ailing father and was impressed with its superiority over the sodium salt. (Acetylsalicylic acid actually had been synthesized some 50 years before Hoffman's attempt,

but it had never been tried clinically.) Bayer, appreciating the marketing potential of this novel form of salicylate, devised a new name for it, selecting initials from the product's German name (*acetylspirsäure*) and adding the chemical suffix *-in* to coin the new name, aspirin. The medicinal uses of pure salicylic acid, today, are confined to such tasks as the removal of external warts and corns.

Despite the commercial success of aspirin, the screening persisted for other variants of salicylic acid, and within years, newer salicylate derivatives emerged. The aniline-linked salicylate acetanilide proved too toxic (particularly on bone marrow) but its byproduct, acetaminophen, was demonstrated to be an excellent antipyretic (known now under such commercial names as Excedrin, Phenaphen, Dristan, and Tylenol). Tylenol, incidentally, obtains its name from the siglum of N-acetyl-p-aminophenol (an intermediate breakdown product of acetaminophen).

Today, 60,000 tons of aspirin are consumed by Americans each year. Assuming equal distribution, this amounts to an impressive 140 tablets per person annually. Were it not for the fact that aspirin is now commercially synthesized, an equally impressive number of willow trees would need be sacrificed to fulfill this demand.

The distinction between discovery and dissemination must be recognized. Native



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Peruvians exploited the antipyretic action of cinchona bark centuries before the Spanish arrived on the west coast of South America. So, too, were the medicinal properties of willow bark recorded long before Stone's careful studies. Indeed, his notes indicate that it was a "local folk remedy," which initially prompted him to study willow bark.

The eminent 13th century Persian physician Al-Samarqandi wrote numerous texts on disease etiology, but his most enduring contribution was his Medical Formulary representing a summation of pharmacologic information known to the Arab world. His analect describes the Egyptian willow (*S. aegyptiaca*) and its merit in making poultices and decoctions. He also comments that Maimonides and other contemporary physicians had employed the weeping willow (*S. babylonica*) for the treatment of migraine and other headaches. Rufinus, the early medieval age physician, also mentions the therapeutic value of the Salix trees. Even more remotely, the 1st century Greek physician and author of a widely employed materia medica, Dioscorides, noted that willow bark provides an excellent astringent for Iliaca Passio (pelvic pain?) and, as a decoction, a fine remedy for the gout.

Are antipyretic salicylates confined just to the willow trees and spirea shrubs? In somewhat lesser concentrations, they are readily demonstrated in the barks of poplar trees and other species. Lt. Col. Charles C. Brown, an American army physician who accompanied the American prisoners of war during the infamous Bataan death march of 1942, describes the utter lack of medications for the treatment of his fellow prisoners. An aqueous extract of the bark of the Philippine guava tree (*Psidium guajava*) provided him with a primitive fever suppressing solution, which, in his judgment, saved many lives during those trying months.

Aspirin, through near universal usage, was assumed to be an unsophisticated medication, one step removed from a placebo. It became the butt of humor in the oft-repeated line: "Take two aspirins and call me in the morning." During the last 3 decades, however, this inconsequential drug has been shown to be substantially more than a mere headache suppressant or antipyretic. Aspirin possesses astonishing capacities in modifying, among other physiologic systems, prostaglandin activity and in so doing lessens the risks of cardiovascular and cerebrovascular disease. The line, no longer flippant, is now: "take an aspirin every other day and diminish significantly your likelihood of myocardial infarction and stroke."

Stanley M. Aronson, MD

Editor's Mailbox

AIDS Article Sensitive, Perceptive

To the Editor:

Please convey my compliments and congratulations to Mr. Quyen Chu for his excellent article, "The Jigsaw Puzzle" which appeared in the March, 1994, issue of Rhode Island Medicine. His account of the details and nuances in his relationship with this unfortunate young AIDS victim was extremely sensitive and perceptive. Such emotional responses are often suppressed by both doctors and patients in the context of fatal illness, and his story was valuable in revealing some important aspects of how

physicians may provide maximum comfort to patients when cures are not available. Sincerely,

Melvin Hershkowitz, MD

Errata

The legends for the figures 2B and 2C on page 427 of the August 1993 issue of RHODE ISLAND MEDICINE (1993;76:8) were inadvertently switched. The upper figure is an MRI and the lower figure is a CT scan.

We regret any confusion this may have caused to our readers.

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Medicine in the Year 2018: Visions of the Future

RHODE ISLAND MEDICINE, acknowledging the inevitability of the future, has devoted this issue to speculative essays on the character and mission of the medical profession in the year 2018. These 10 papers offer views varying dramatically in style, concentration and levels of optimism. While the essayists come from different professional backgrounds, no effort had been made to represent all the conventional medical disciplines.

The Editors

Public Health Policy and Practice in the 21st Century

Barbara A. DeBuono, MD, MPH

As we move towards the Year 2000 and beyond, the American public health system will emerge as a strong public-private partnership. Government participation will continue to be structured with different responsibilities performed at federal, state and local levels. The country's health care delivery system will combine the best elements of its public and private sector systems. Every American will be entitled to health care coverage including preventive, acute, and long-term care. The following health industry sectors will interdigitate but remain somewhat autonomous: personal health care, public health, research, professional education, manufacturing and financing. Here's what will happen:

- The health care delivery system will become seamless from birth to death with the merger of all populations into a blended system.
- Universal health insurance coverage will result in increased use of services, improved health, and a significant closing of the health gap among culturally diverse populations.
- Personal health care spending will continue to rise, but the rate of increase will be slower. Health system productivity will grow due to improved management.
- Public health spending will also rise, in recognition of an expanding need for preventive health services, and the high rate of return—socially and financially—on investments in prevention.
- State health departments will play an increasingly important role in managing

the health care system, in partnership with providers, consumers, the business community, institutions of higher education, and other state agencies performing health-related functions.

Personal Health Care Spending

Three factors will contribute to the continued rise in personal health care spending: (1) use of services will increase because the American health care system will have more services to offer, an aging population will require increased care, and universal insurance coverage will give more people access to providers; (2) prices will increase at least as fast as inflation, and probably faster, because new services generated by science and technology have a high front-end cost; and (3) health facility labor costs will increase as employment and wages rise and specialization increases.

We can ponder a future health system that systematically provides early preventive, diagnostic, therapeutic and rehabilitative services. This has tremendous potential for reducing downstream medical costs and disability payments for preventable illness and injury.

Corporate America will view this kind of potential as an opportunity. Front-end investment will be made—and programs aggressively managed—to secure downstream benefits. The problem with the current cost control debate is that it is being framed in a cash flow rather than an investment context. Health care pundits will ask what investments should we be making over the next 10 years to reduce the costs to society (from preventable illness, injury, and disability) by 2018? How can we finance these investments in a way that enhances rather than weakens our health system? What changes do we need to make in our management of the health system to assure we achieve long-term health and financial benefits?

The future work of public health will be to become an active partner with other state agencies that are engaged in the interface between social problems and their medical implications.

Health Systems Management

Improved health system management will be achieved, through state-by-state implementation of the federal health mandates, regulation of key elements of the health industry (eg, food and drug, environment), and investments in research, training, the integration of prevention into the medical practice setting and public health activities.

- A blueprint for the "business-like" management of the overall system will include:
- Goal-setting, expressed as measurable

ABBREVIATIONS USED IN THE YEAR 2018 ESSAYS

AARP: American Association of Retired Persons
AIDS: Acquired immune deficiency syndrome
APC: Automated pharmacomputer
B/BF: Blood/body fluid
CAT: Computerized tomography
CCDS: Cranston cellular depletion syndrome
EAS: Environmental allergy syndrome
HIV: Human immunodeficiency virus
MD: Major depression
MRI: Magnetic resonance imaging
NIMH: National Institute of Mental Health
PMS: Pre-menstrual syndrome
POC: Point of care
SSAM: Selected serum analyte measurement
U/SENERM: University/Southeast New England Regional Medical Laboratory

Barbara A. DeBuono, MD, MPH, is director, Rhode Island Department of Health, and associate professor of medicine, Brown University School of Medicine, Providence, Rhode Island.

outcome objectives. State health agencies will continue to perform core public health functions: health system planning and capacity building, health system standard-setting and regulation, disease prevention and health promotion, information system and laboratory support services, and outreach to high-risk and underserved populations.

Other state agencies performing health-related functions (eg, mental health, environmental management, workplace and highway safety, child protection, health care financing, substance abuse) will continue in these roles, but state health agencies will accept accountability for evaluating the impact of their efforts.

Providers of personal health services will continue in their accustomed roles, but state health agencies will involve them actively in health planning, prevention, surveillance, and evaluation.

We will see a change towards a more structured and interdependent health industry that encourages and requires improved management. State health departments will continue to be key facilitators of improved management through their planning, regulation, and evaluation functions. They are guarantors of patient access to services, and physician freedom to deliver "best practice" medicine, notwithstanding pressures for cost control.

The Public Health Mission

The mission of state health agencies is to preserve, protect, and promote the health of state residents. Their ability to carry out this mission over the next quarter century will depend on their ability: (1) to maintain "core" public health functions; (2) to respond to the social dimensions of health problems; and (3) to adjust their role to the changing configuration of the health system, itself.

Core Public Health Functions. A 1988 Institute of Medicine report expressed concern that: (1) complacency had developed in carrying out traditional public health functions (eg, immunization, food and water inspections) in the absence of clearly visible threats to health; and (2) a tendency to locate some public health functions in state agencies other than health departments.¹

The price of liberty, John Curran said, is eternal vigilance. The same is true of public health. The discipline will strengthen and expand its *assessment* function to include new, previously unmeasured variables. In 2018, continuing dangers to public health will include disease pathogens (emerging new microbial agents) and environmental pathogens (toxic substances). Their ongoing measurement will be critical to preserv-

ing the integrity of public health. Emerging social pathogens such as violence and substance abuse will require careful measurement and monitoring. Public health will sharpen its skills to improve surveillance for these new pathogens with the same vigilance and integrity as now happens with traditional communicable disease tracking.

By 2018, new linkages will be made between assessment data on violence and substance abuse with innovative prevention programs. The advocacy community for violence and substance abuse, child protective agencies among others, will apply public health principles of prevention to their community-based programs. Government will have shifted its heavy investment in the latter part of the 20th century, from treatment towards prevention. Prevention programs for substance abuse and mental health beginning at increasing early ages in children will become the cornerstone of curtailing the cycle of domestic violence. Public health will be charged with these responsibilities.

As the value of prevention for these social pathogens becomes more evident, state government will turn to public health for the tools needed to address these problems. The future work of public health will be to become an active partner with other state agencies that deal with social problems that have medical implications. This includes cooperative relationships between health and education departments regarding school health programs, the health and human service departments regarding the health service delivery to low-income persons and health departments and child protective services to address child abuse.

By 2018, health departments across the country will have multiple cooperative partnerships with other state agencies, in which health departments seek their participation in core public health functions and provide them with goal and standard setting, care coordination, quality assurance, and outcome evaluation services.

Social Dimensions of Health. The most radical change in public health in this generation, equal in importance to the introduction of sanitation and immunization to prevent communicable disease in previous generations, has been the implementation of behavior change strategies to prevent chronic disease, injuries, and other adverse health events. Such modification of behavior requires not only aggressive public education and motivation, but also modification of underlying social pathologies, such as poverty, homelessness, discrimination, and unemployment.

The range of health concerns which require *social* intervention are formidable (eg,

sexually transmitted diseases, teen pregnancy, child and spousal abuse, community violence, teen risk-taking behavior, drug and alcohol abuse, poor nutrition, smoking, obesity, poor patient compliance with medical regimens, anxiety, depression, low self-esteem). Prevention in these areas will require interventions that public health agencies cannot implement by themselves. As a consequence, the next 25 years will also see the development of extensive health department partnerships with community-based social service providers and consumer groups.

Whether through managed care plans or other mechanisms, patients seeking medical care in 2018 will receive comprehensive case management routinely, including a social service needs assessment and appropriate follow-up.

Prevention will be put into practice. School children with health or social services needs routinely will be referred to qualified providers. Public health outreach programs will be designed and administered in concert with consumers representing target communities for intervention. Service programs will have sufficient respect for consumers to be language-specific and culturally responsive not merely out of personal consideration but because social interventions will not work otherwise.

Health System Responsibilities. Finally, over the next 25 years, state health departments will increasingly accept their responsibility for expanding the scope of planning, regulatory, and evaluation functions to cover the whole health care system. Health departments will provide the voice and the vision for a healthier America and will keep the organized delivery system focused on improving the health status of its membership. This does not require the grant of additional powers, but merely that we lift the eyes of the health care partnership to a horizon that shares the vision of advancing health together. The proper and necessary response of health agencies to the challenge of reform will be to provide leadership. That is what public health is about.

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A Less Than 2020 Vision of Future Undergraduate Medical Education

Richard Weil III, MD

It is widely believed—or at least frequently asserted—that the United States needs not only a new health care delivery system but also a new kind of physician for the 21st century. This view is paradoxical in the perspective of world consensus that US health care is the best anywhere, and American medicine during the last 3 decades has been the leader in pioneering organ transplantation and gene therapy. The rationale for change in US health care delivery becomes more understandable if one recalls its cost, the highest in the world by measures such as percentage of gross domestic product (now about 14%), and if one recalls that our infant mortality rate is still relatively high. Furthermore, 20 to 40 million of our citizens at some point during any year will at least temporarily have no health insurance, and another possibly equal number are trapped in their jobs because prior health conditions would brand them either unemployable or ineligible for new health insurance were they to try to change jobs. Commentators on the so-called current “health care crisis” frequently overlook the fact that many of the medically uninsured do in fact have access to health care, sometimes with difficulty, through public clinics and hospitals such as Bellevue in New York City, which has been providing care to indigent patients for more than 250 years. Nevertheless, the present system is not optimal and should be improved.

Medical schools must try to prepare their future graduates not only to respond to changes in our health care system but also to participate in improving the system. Public sentiment harks back to the horse and buggy days of the early 20th century when physicians’ empathy with patients was perhaps more visible and possibly more heartfelt. As medicine has become more scientific and more effective, gaining the capability to cure many non-viral infections and to re-

vascularize the myocardium of octogenarians, physicians and surgeons of the late 20th century have too often become technocrats. At the same time, patients have developed expectations for invariably successful therapies that frequently cannot be fulfilled by even the most skilled and most humanitarian physicians. Current polls suggest that most Americans think well of their physician but generally regard doctors as cold-hearted, self-serving, and avaricious. Despite the doctor’s tarnished image, applications for medical school admission are increasing.

The 126 US schools of medicine have a duty to the roughly 16,000 young men and women graduating every year to help them become the best possible physicians. What does “best” mean? Most knowledgeable, most empathetic, most devoted to preventive care, most cost-effective? Part of the difficulty of designing a medical curriculum for 25 years or even 10 years from now is the difficulty of defining the objective—the physician we are striving to develop.

It is currently popular to extol the virtues of primary care—general family medicine, general internal medicine, general pediatrics and probably general gynecology as a model for more than 50% of future physicians in the US, with a cadre of more narrow specialists in reserve to do herniorrhaphies or treat aplastic anemia. Should AIDS be treated by the family physician, who probably has never even seen a case Pneumocystis carinii pneumonia or Kaposi’s sarcoma, or should treatment be rendered by infectious disease specialists and oncologists who have the training and experience to apply modern diagnostic and therapeutic methods to these conditions? Since an AIDS patient with either of these problems is likely to die from AIDS within a few years whether expert treatment is provided or not, should we assign the AIDS patient to a caring family physician who will do all he or she can for the patient, at lower cost than specialists’ care, for whatever time remains to that unfortunate patient? Or should the AIDS patient’s physician-advocate fight for

Schools of medicine must continue to identify and teach future students a core body of scientific vocabulary and information, as well as specified abilities, sufficient to support lifelong learning.

every possible additional week of survival and exhaust every potential treatment opportunity, regardless of economic cost, in the hope that the resulting incremental prolongation of life will be vindicated by the timely arrival of new effective therapy before the patient succumbs?

By 2018, AIDS probably will be controllable by a combination of vaccines and antiviral agents, but the issue of cost-benefit ratio as a measure of the value of therapy will not have disappeared. By then, perhaps, the malpractice litigation cloud that currently damages many patient-physician relationships will have lifted, but the issue of defining reasonable expectations for the fallible physician will not have disappeared. Ten years ago the Association of American Medical Colleges published the Report of the Project Panel on the General Professional Education of the Physician, titled *Physicians for the Twenty-First Century*.¹ The introduction, signed by Steven Muller, PhD, president of Johns Hopkins University, states the project panel “affirms that all physicians, regardless of specialty, require a common foundation of knowledge, skills, values, and attitudes . . . Every physician should be caring, compassionate, and dedicated to patients . . . committed to work, to learning, to rationality, to science, and to serving the greater society . . . Ethical sensitivity and moral integrity, combined with equanimity, humility, and self-knowledge are the quintessential qualities of all physicians.” This 1984 vision of the 21st Century physician still seems appropriate a decade later.

The major goal of the medical program at Brown University, as expressed in a recent mission statement, is the graduation of liberally educated students who view medicine as a socially responsible human service profession. Other goals in the mission statement include instilling altruism, ethical judgment, desire for community service, communications skills, clinical skills based on science, desire for lifelong learning, problem solving abilities, and self-awareness.

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How should we implement these visions? Will the 21st century physician be more or less of a scientist than the physician of the 1990s? The dehumanizing influence of scientific specialization must be thwarted without removing the invaluable contribution of science to the rendering of effective clinical therapy. Several medical schools have already begun to break down the now traditional division of the medical curriculum into 2 preclinical basic science years followed by 2 clinical years. These new curricula attempt to integrate the basic science and clinical faculties across departmental lines and to integrate science into all 4 years of a clinically oriented curriculum. In this model, the examinations for medical students can be prepared by an integrated faculty that strives to maintain balance between excessive emphasis on either basic science or clinical medicine. If such curriculum trials prove successful, as measured preferably by performance criteria, the National Board of Medical Examiners might redesign its tests to better evaluate the candidate's integration of scientific and clinical knowledge.

It has been common for medical schools to assign approximately equal curriculum hours to each of about six basic sciences during the first 2 years of medical school, allowing each departmental faculty to determine what to teach students during their respective hours of instruction. Medical students all too frequently have not been deeply interested in these science courses, which have too often been presented as a poorly integrated series of chemical actions, physiologic observations, and anatomic structures, with course content adjusted over the decades to reflect contemporary information. Schools of medicine have generally resisted the notion of defining a core body of information to serve as a database for all practicing physicians. Even though the molecular medicine of the 1990s had not been discovered when today's middle-aged physician-teachers attended medical school, these teachers had to assimilate sufficient core biomedical knowledge in the 1960s to permit them to continue to learn effectively during ensuing decades, or they could not teach or even practice medicine effectively in the 1990s. Schools of medicine must continue to identify and teach future students of medicine a core body of scientific vocabulary and information, as well as specified abilities, sufficient to support lifelong learning. Future students will receive larger doses of social sciences and informatics than their predecessors and may do some of their learning in the virtual reality environment provided by computer simulation, such as is currently in an early stage of develop-

ment for student pilots. Future physicians will rely more on computers as memory banks capable of storing, organizing, analyzing, and making available vast quantities of biomedical information in a form immediately usable for diagnosis and for treatment of patients. A computer-generated differential diagnosis could be provided in response to a patient's initial complaint, followed by narrowing of the differential as more clinical and laboratory data became available to the physician or to a student trying to learn the rudiments of pattern recognition that is central to establishing an accurate diagnosis. For purposes of student learning, interactive software could require the student to formulate questions for the patient or for laboratory testing, with the computer evaluating the student's approach to diagnosis. Similar software could evaluate each step of the student's approach to therapy, including choice of medications, their side effects, their interactions, and their relative cost effectiveness. Some of this software is already available.

Future medical students will also spend much less of their clinical learning time in hospitals, where even now less than a quarter of all patient-physician encounters occur. At least some of the ambulatory care learning will take place in managed care organizations, which are already assuming large roles in US health care delivery. In 25 years, these managed care entities may own the hospitals, which by then will be considerably fewer and will exist mainly to deliver tertiary and quaternary care, such as organ transplants. The managed ambulatory care sites will be the medical student learning laboratories for primary care and secondary care. By then the solo practitioner's office may be a historical curiosity.

Medical school faculties must not wait

25 years to assign a higher priority to meeting the health care needs of the nation, even when this societal obligation does not completely coincide with their medical school's vision of its own ideal destiny. Schools of medicine, trusted by the nation to produce its physicians, must serve the public interest before parochial objectives and must train physicians to respond to public needs along with the needs of individual patients. There is no compelling reason to believe that in 25 years there will be any diminution in the tension between the public imperative to contain health care expenditures and the individual patient's desire to receive any care that could be beneficial. Therefore, medical educators must arm the physicians of the future with sufficient information and skills to function ethically, effectively and compassionately in this environment of sometimes non-congruent obligations. The physicians of the future must be broadly educated, not merely trained, and must possess sufficient cognitive knowledge, basic skills including decision-making, moral values, and a propensity for learning to enable them to continue to be the proficient healers and communicators their patients and society have every right to expect.

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Reproductive Medicine & Family Planning—2018

Donald R. Coustan, MD

Greetings from the year 2018. I was delighted to be asked to provide a review of the predictions I made in 1994, regarding reproductive medicine and family planning as they now exist. At this point I am old enough that my friends and colleagues are sure to “humor” me by pointing out that I was only slightly more off target than the other prophets who made predictions back in the 1994 issue of *RHODE ISLAND MEDICINE*.

Well, we have finally gotten used to our new health care system. Recently an innovative movement was formed to “privatize” health care. Of course, this was met by strong resistance from the medical community. Obstetrician/gynecologists continue to be primary providers of health care for women, working together with colleagues in internal medicine, pediatrics and family practice to improve the overall health of our community.

There have been some dramatic changes in our approach to human reproduction during the past 25 years. The human genome has been catalogued, and we understand the structures of genes determining most known inherited diseases as well as many which you in 1994 did not even suspect could be inherited. Society continues to grapple with ethical and moral issues similar to the ones we faced then. As new technology became available, we struggled to draw a line between helping those who are suffering and “playing god.” We are now capable of changing the genome of a fetus, particularly when a gene product is missing or deficient. With regard to devastating and fatal childhood illnesses the decision to intervene is usually straightforward. For example, I can imagine no moral reason not to insert a gene capable of producing the alpha hemoglobin chain into a fetus with alpha thalassemia. At the other extreme, the insertion of a gene sequence to enhance intelligence is currently banned by international law, lest one nation develop a super-intelligent population, outsmart the other nations, and come to dominate the world. Situations lying between these two extremes are the source of continuing debate. Limited resources continue to be an important factor in making

determinations as to where gene therapy is to be applied.

The good news is that our family planning technology has become so advanced that inexpensive, implantable but easily reversible hormonal contraception can be provided to either gender, at any time. Most pregnancies are now planned, and the abortion debate has cooled considerably because effective safe contraception has lessened the probability of unwanted pregnancy. In addition, the widespread availability of RU486 has moved pregnancy termination out of abortion clinics and into the patients’ homes. The drug was temporarily removed from the market in 2004 as part of a negotiated agreement to bring about a cease fire between the contending sides in the abortion debate, but by then the chemical formula was widely available and entrepreneurial former narcotics dealers began producing it in garages and outbuildings. It was finally legalized in 2010 by a national referendum. Of course, pharmacies are now being heavily picketed if they dispense this medication, and a couple of drug stores in the Midwest were bombed recently.

Things have advanced quite a bit in the field of prenatal diagnosis. Amniocentesis and chorionic villus sampling are now archaic procedures because we have the ability to obtain fetal genetic material by isolating fetal cells from maternal blood, first described in the mid-’90s. The catalogue of prenatally diagnosable conditions has expanded exponentially, but it is still necessary to suspect the presence of most conditions on clinical grounds or by screening tests. The resources are not available to perform an unlimited number of genetic tests on every fetus.

Society has finally concluded that our enlarging population poses a major threat to the stability of the earth’s resources. Consequently our national health care insurance system does not underwrite the costs of assisted reproductive technology. Only couples with significant personal resources are able to pay for *in vitro* fertilization or similar treatment. Fortunately the procedures have been improved to the point that more than half of couples who make this investment take home a baby, and it is generally only one baby at a time.

The physiologic basis of premenstrual syndrome is now understood, and a simple and inexpensive treatment is available. Because PMS turned out to be so prevalent, and its effects wasted so many resources, this advance has allowed us to shift those resources to more productive uses includ-

The human genome has been catalogued, and we understand the structures of genes determining most known inherited diseases as well as many which you in 1994 did not even suspect could be inherited.

ing famine relief efforts in war-torn Bosnia and Somalia. Incidentally, President Magaziner has promised to put an end to the wars in those two countries by activating a plan called the Greenhouse Compact, which is expected to restore prosperity.

The national collaborative study on women’s health care has established that postmenopausal hormonal replacement therapy carries considerably more benefit than risk, especially for women who are genetically prone to osteoporosis or coronary vascular disease. An elderly but still feisty Jane Fonda now hawks environmentally correct estrogens that are produced by the ovaries of horses fed only on organically grown, pesticide-free, fodder. Women are now outliving men by an average of 20 years because hip fractures and coronary artery disease have become rare. This has reduced the need for orthopedic and cardiovascular surgeons, discouraging medical students from entering these fields. Most of these students have entered primary care residencies such as family medicine, internal medicine, obstetrics and gynecology, and pediatrics, enabling us to finally reach the federally mandated goal of 55%! I find it quite ironic that estrogen therapy has saved our entire health care system.

The Rhode Island Medical Society has continued to thrive, and as the Brown University School of Medicine grew in stature in the late ’90s and early 2000s when the faculty decided to publish their works in *RHODE ISLAND MEDICINE* rather than the *New England Journal*. World wide circulation of *RHODE ISLAND MEDICINE* reached 900,000 last year, and editor emeritus Dr Stanley Aronson is considering a swimsuit issue which will feature outstanding former Medical Society Presidents such as Bud Kahn, Pete King, Richie Wong and Dick Bertini. Meanwhile, the Medical Society has used the proceeds of the journal to turn the Frances Street facility into a casino and hotel complex which has become highly successful. Its popularity is attributed to its proximity to the State House.

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Health Care for the Aging: The View from 2018

Marsha D. Fretwell, MD

As the 1990s focused on the downsizing of the defense industry, so, too, were the first decades of the 2000s devoted to the downsizing of the acute care side of the health care system and the building up of our wellness and health promotion resources.

I feel it is only fair that I begin with a current description of myself including my beliefs and biases about the origins of good health and an effective health care system. I am about 50 years old, which, by family history, female gender and my reasonably active lifestyle, puts me 5 or so years into the second half of my life. In the year 2018, I will be 75 years old and probably beginning to think about retiring from my career in gerontology and geriatric medicine. Since I entered medical school 25 years ago, this essay is written from the mid point of my experience in the health care system.

By nature, I am what one might call a "pragmatic optimist." Whether I am pondering the next moment of life, or the next week, year, or even the next 25 years, I tend to have an optimistic, even idealistic, view of what is possible. That tendency is balanced, I think, by a clear understanding that between this moment and the ideal future are many steps and many unknowns. My years practicing medicine have been most rewarding, especially with my old and very old patients. Often, patients and I discovered together that many infirmities thought by others to be the inevitable and irreversible results of aging were not inevitable and responded positively to therapy, if we took an optimistic view.

These very old patients, as you might guess, also provided me with other insights about their lives, several of which have shaped my thoughts about what is necessary and what is possible for the future of health care. Almost all relate their healthy lives to their participation in useful activities, which, in most cases, were also the root of their sense of belonging to the family, group or community. Or put another way, when they began to feel useless, their sense of belonging, their vitality and health also seemed to slip away. Second, they warned me "not to put off until tomorrow what you can do today," a behavior that the kind editor of this journal would say that I have

not yet internalized. In pursuing this proverb more deeply, I found two separate thoughts: have your dreams about the future and have the courage to try to make them happen.

Several years ago, I developed a "mission statement" for my career in medicine that consists of two professional goals: 1) to help shift the current focus of the health care system from the treatment of disease and survival at all costs to a new focus promoting health and assisting each person to achieve and maintain their highest level of independent function; and 2) to restore the doctor-patient relationship to its fundamental place as the anchor of the practice of medicine and thereby restore the balance between the art and science of medicine. These goals, I believe, not only address the issues of quality in health care, but also provide an approach to containing excessive costs.

As I now look back 25 years and look forward 25 years, I begin to feel as if I am perched on a pendulum that has just completed half of a 50-year cycle, a cycle of change in health care that was set off by the provision of universal access to medical care services for the elderly and the poor, ie, public funding in the form of Medicare and Medicaid; a cycle of change that has been heavily influenced by sophisticated biological and medical research and the subsequent development and wide implementation of advanced diagnostic and therapeutic technology.

Today, I predict that we are at the limits of the pendulum's swing, having completed a 25 to 30-year cycle filled with many unintended consequences. A strong focus on the training of specialists, which was critical to the discovery of new treatments and technology, has led to a disproportionately large number of specialists, fragmentation of care for those older patients having disease in several organ systems, and inappropriate use of technology, especially at the end of life. All of these are important factors influencing the current structures and costs of our system. First, specialty practice and the resultant dependency on the hospital for technology have determined

the site of most health care and the way physicians have organized themselves in practice. Now, efforts to contain the resultant health care costs have influenced others to organize physicians into practice structures that serve these administrative purposes. The solo or small group generalist practice located in a community neighborhood is now an endangered species, replaced by large groups made up of few generalists and many specialty physicians. These practices are now located in rather intimidating facilities next to a tertiary care medical center (what used to be called the community hospital) or to a suburban shopping mall.

In 1993, health care is spoken of as an industry, the fastest growing industry in what is acknowledged to be a rather stagnant national economy. Increased access to care for a growing number of older people and the very poor has led to federal and state expenditures for health care that are overwhelming government budgets. Despite many efforts to contain the costs of these programs, they continue to rise. In a system that increasingly has become organized around its financing mechanisms and cost containment rather than the needs of patients and the goals of care, physicians have become providers, patients have become consumers, and there seems to be no acceptable language for the healing relationships that are central to our professional identity. Business jargon pervades all discussions. Increasing proportions of the health care expenditures are devoted to managing the professionals and the pieces of paper that document their services. Fewer dollars are going to directly providing that care.

In 1993, health care was declared a "crisis" on the national political agenda. Two factors brought the nation to this perception: the excessive and growing costs of our existing system and the increasing numbers of non-poor individuals who are unable to afford insurance coverage. Several proposals for fundamental changes in the financing and delivery of medical and psychological services have been sent to Congress. The central themes of the current debate are: 1) Should we, as a nation, provide

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universal coverage to all citizens as we did 30 years ago for the old and the poor? 2) Should this coverage be financed, on the whole as it is now, by mandating that all employers provide insurance coverage? 3) Or, should it be financed like Medicare, by federal taxes, or like Medicaid, by federal and state taxes? 4) Should we move to a single payer system? 5) Or should the insurers and health plans, who currently produce much of the paperwork and excessive administrative costs, be left in the picture to preserve competition as a cost control?

These were the questions. What were the answers? The pendulum swings, and it is now the year 2018. One of every four Americans is now over the age of 65 years. Those born in 1953, our favored "baby boomers" are now our "aging boomers." Those born in 1943 are now 75, those born in 1933 are 85 years old and those born in 1923 are 95 years old. The average life span of both men and women is about 90 years old, demonstrating the positive effects of the lifestyle changes initiated in the 1990s. Sixty-five is no longer considered a watershed year in anyone's life because Medicare has now been completely integrated into the single federal health care financing mechanism. Because coverage is related neither to age nor place of employment and there is no fixed age for retirement, individuals usually work until they are about 75 years old, having several jobs and types of careers during their 50 or so years of employment. Few individuals, regardless of age, work more than 30 hours a week. Older people remaining in the workplace have led the younger members of society to finally recognize exactly how long everyone is living and lifestyles around work and leisure finally begin to reflect the advantages that technology has brought us.

This recognition that most people are going to live more than 80 years has two profound effects on the health care system. First, the "hurried child" and the "overwhelmed adult" syndromes of the late 20th and early 21st century will finally diminish as the American culture reworks its perceptions of time. We now find both parents working 20 to 30 hours a week so that they can better share domestic responsibilities. Stress levels in both children and adults have fallen with subsequent reductions in the addicting behaviors of smoking and substance abuse in both groups. The improved health of adult children and grandchildren, in turn, has a very salutary effect on the health of the grandparents. And, for the first time, there are many grandfathers surviving into their 80s, the result of the increased balance in everyone's lifestyle.

Second, as our society has grown more

conscious of and comfortable with longer life spans, many more individuals have also grown more comfortable with the idea of death. The fear of death, so pervasive yet denied in the day to day operations of health care in the 20th century, is no longer denied. Rather, discussions of life and death have replaced sex and politics on the talk shows. Everyone over 21 years old has completed their advanced directives, and donation of organs for transplantation is flourishing.

My predictions thus far reflect my belief that the increases in the average life span of humans do not necessarily bring society increasing numbers of ill and disabled individuals. What has happened to the health care system over the last 25 years to allow so many individuals to continue to lead productive and useful lives? The most important outcome of the 1993 health care debates and reform effort was to obtain a national consensus providing universal coverage for all. The second most important change was in the financial incentives of the system: away from acute care and patient entitlement toward health promotion and individual responsibility not only for one's health, but also for the bill. The third most important factor influencing the changes came from continued advances in technology, particularly the wide implementation of electronically transmitted information. Vice President Gore's information highway of the 1990s became the central technology that allowed medicine to recover the patient-doctor relationship and restore the primary care practices back to the neighborhoods of our communities.

In 2018, there is a single health care financing mechanism funded from federal taxes, similar to the funding of Medicare, but covering all citizens regardless of age or income. The insurers and health plans are still very much a part of the scene and, because early on, they were forced to accept all of the federal funding for health care in the form of "capitated risk contracts," they actually played a major role in the successful reorganization of the health care system and control of the increasing costs so prevalent in the 1990s. Having their profits placed at risk by excessive administrative costs and inappropriate utilization of care, they became the leaders in reshaping the practice of medicine toward primary care, disease prevention and health promotion. It will be noted that the curriculum committees of US medical schools were much slower to make the changes. But not the nursing schools. Being a bit more intuitive, they immediately began to train more nurse practitioners and health educators and today we, as a health care system, have benefited. Many of the most successful primary care

practices are collaborative partnerships between physicians and nurses.

The health plans were thus the first, after a certain geriatrician, to declare that the goals were to get people functioning optimally and to keep them there as long as possible. They began to diversify into a job creation industry once they recognized how important gainful employment was to an individual's health. They also led the way in the development of the electronic highway connecting all clinicians and sites of health care. Initially, they tried to buy and control as many of the remaining primary practices as they could. They eventually discovered that the essence of successful primary care (healthier people and lower costs) depended upon allowing these eccentric generalists to remain in solo or small group practices. The existence of electronic information systems for clinical and administrative activities saved everyone so much time and money that the patient-doctor relationship again became the centerpiece of excellent medical care.

What then happened to our tertiary care medical centers? Many disappeared as advanced technology allowed us to provide more diagnostic tests and treatments in community offices and patient's homes. Facilities that more resembled the old nursing homes were now well staffed, providing acute care for those older individuals who chose or were unable to be cared for in their homes. Those that remained continued to play a critical role in the development and application of complicated medical technologies such as genetic replacement therapies. As the 1990s focused on the downsizing of the defense industry in the United States, the first decades of the 2000s were devoted to the downsizing of the acute care side of the health care system and the building up of our wellness and health promotion resources.

A utopian story? I think not. An optimistic, yet pragmatic story? I hope so. What will finally turn this mammoth and resistant health care industry around and send it back in the direction of individual healing relationships that collectively lead to a healthier community? Here's the pragmatism. It simply costs too much money to keep doing it the way we are doing. As the US population simultaneously grows larger and ages, the only solution to the quality-cost dilemma is to prevent disease and help everyone become healthy and functionally independent.

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Psychiatry in the Year 2018

Martin B. Keller, MD
Diane L. Hanks, MA

The Supermall

It is a rainy, November Saturday night in the year 2018. Peter, an attractive young man in his early 20s, walks through the local Supermall, where one can buy anything from gum to guns. Peter has been depressed lately for several reasons: his girlfriend recently dumped him for an exchange student from Paris; his divorced mother, at the age of 49, has decided to have another baby and has an appointment at a genetics clinic tomorrow afternoon, where she may choose the baby of her choice from a catalog; Peter's father lives across the country and is very involved with his new family; Peter's only sibling, an older sister, is doing community service in North Korea, to reimburse the federal college fund; and Peter's best friend, Mike, is on his way to the moon as part of a graduate school geological field trip.

Supermall is open 24 hours a day. Peter enters the CVS at 11:45PM and walks to the back of the store. On the wall are a computer and, in front of the computer screen, a comfortable chair. Peter inserts his driver's license to verify his age and presses the key labeled PSYCH. In an instant, a menu appears. Peter lightly touches the D key for his selection, and another menu appears that allows him to check off how many of the following symptoms he is experiencing: insomnia, lack of appetite, apathy, unhappiness, low self-esteem, no energy, and hopelessness. Peter clicks off three of the seven symptoms, and the computer lets him continue to the next level.

Another menu appears above a list labeled MOTHER, FATHER, and SIBLINGS.

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Peter types in RA next to his father, for recovering alcoholic; mD next to his mother, for medicated Dysthymic (the key labeled MD represents Major Depressive; mMD is medicated Major Depressive); and P next to his sister for PERFECT. The next menu that pops up is a checklist of childhood illnesses. Peter uses the computer control stick to check off EAS (environmental allergy syndrome), a common childhood ailment in the 21st century. Another menu pops up with a list of 30 of the most common allergies to food and medication; Peter checks none of these.

The computer asks Peter to key in his height, weight, and federal insurance number. He does so, and the computer screen turns a vivid blue and displays a green four-digit code. Peter rises from the chair, walks a few feet to a vending machine, punches in the four-digit code and out comes a bottle of the appropriate and most efficacious antidepressant, according to the newest, state-of-the-art APC—automated pharmacomputer. The APC makes a logical treatment choice based on the available information and decides that Peter needs an alpha F₁ partial agonist and beta M_{3a} antagonist with a rapid onset of action, 6 to 12 hours, with minimal side effects, no danger of liability in overdose, no confirmed adverse interactions with other medications, and is effective in 85% of the people with major depression.

Kate has been waiting in the homeopathic aisle for the young man to leave. As Peter walks away, Kate nervously takes a seat. It takes her several minutes to figure out how to use the APC, she has trouble concentrating, but she knows she must hurry.

Kate is a 35-year old mother of three . . . no, two. Kate's infant son died 4 months ago. The night he died, she had gently laid Timmy in his crib and had watched him nestle into his soft yellow sheets, the sheets her sister had given to her that were covered with white ducklings. Underneath the sheet was a brand new mattress, top-of-the-line, the salesman had told Kate and her husband. Inside the mattress, a quarter-inch below the sleeping infant, was a scanner

There are miraculous new pharmacological agents now being developed that will help many to lead more fulfilling lives; but we must make certain that there is always a physician or health care worker available to look into a patient's eyes and see what technology cannot.

that would monitor Timmy's breathing and heartbeat. That night, there was a power surge at an electrical transmitter a few blocks from their house, and the monitor's blinking light that was attached to a switch by the side of the crib stopped blinking. Kate and her husband slept late the next morning because the alarm clock did not wake them up, and neither did Timmy.

Kate checks off all seven of the symptoms under category A (anxiety disorders), keys in her unremarkable genetic information, types in her height and weight, and inserts her insurance card. A few moments later, she walks to the vending machine to get her medication: an anti-anxiety agent with no risk of tolerance or addiction that does not cause drowsiness or other side effects.

Sounds far-fetched? I wonder.

Where We Are

Over the past 20 years, advances in the neurosciences have increased our ability dramatically to alleviate the suffering of patients with mental disorders such as manic depressive illness, panic disorder, phobias, schizophrenia, or obsessive-compulsive disorders. Psychiatrists need a working knowledge of psychobiology, the effects of psychological adaptation and biological systems to treat patients efficaciously. Investigations of neurochemical transmission have identified receptors in the brain that specifically effect neurotransmitters. When these neurotransmitters are altered, a person's mood is effected. Research has revealed that norepinephrine, dopamine, and serotonin neurotransmission effect mood disorders. Newer drugs have now been developed to treat depression and anxiety that are safer for the patient, in terms of overdose and side effects, than the older medications.

Early diagnosis and treatment are critical to a positive outcome. For example, it has been established in the last several years that a minimum of 6 months of continuation treatment is necessary to prevent relapse after patients have an initial remission from an episode of major depression. Recently

published research also shows that after full recovery from a depressive episode, 3 to 5 years of maintenance treatment is needed to prevent subsequent episodes of illness in patients who are at high risk for recurrence.

Although maintenance trials longer than 3 years have not been conducted in a double-blind method for any disorder other than major depression, such studies are clearly needed for the more pernicious and recurrent mental illnesses mentioned earlier. Lifetime maintenance treatment may be necessary for those patients with chronic and recurrent illnesses with high rates of psychosocial and psychopathological morbidity and mortality if left untreated.

Randomized clinical trials on the efficacy of psychotherapy have been few. The small number of research studies that demonstrate efficacy in a scientifically controlled trial creates a tough dilemma. A meaningful proportion of experienced practitioners, teachers, and researchers believe that psychotherapy, particularly cognitive behavior therapy, interpersonal therapy and structured family therapy, are effective alone and may be a necessary adjunct to pharmacotherapy to bring about the best results for the majority of patients in treating acute episodes, especially in the continuation and maintenance phases of treatment. In the current era of cost containment when low cost assumes greater importance than "value," this rather costly treatment may fall by the wayside for all but the wealthy who are able to pay out of pocket. I fear that training residents in the art and skill of psychotherapy based on understanding human development may get short shrift—if for no other reason than that it is not reimbursable.

Another example of how psychiatry is changing, partly because of economics, is evident in who is providing mental health care. A recent study suggests that as many as 95% of those with mental and emotional disorders are treated by a general practitioner.¹ Considering the size of the population and its ever increasing need for mental health services, psychiatrists cannot conduct all of the investigation and treatment necessary to care for everyone who is ill. Other health care professionals such as social workers, clinical psychologists, and psychiatric nurses, provide invaluable support but, more often, for the general practitioners rather than the psychiatrist. Medical students who prepare for a general practice usually do not spend more than 6 months of concentration on psychiatry.

There is evidence that this is a major factor contributing to the underdiagnosis and undertreatment of patients suffering from mental illness seen by general practi-

tioners. Perez-Stable et al reported that many primary care physicians fail to detect and diagnose depression in their patients.² It is also disturbing that significant rates of underrecognition and undertreatment also exist when patients are seen by psychiatrists and other mental health professionals. Results of the NIMH Collaborative Study on the Psychobiology of Depression, a five-center prospective follow-up of the course of depression in 955 depressed probands and 2,600 first-degree relatives showed low levels of somatotherapy throughout the study period, even though these patients were ill enough to seek treatment at university medical centers; and a high proportion had a course of illness marked by chronicity and multiple recurrences.³ Moreover, before entry into this study, only 34% of the 217 patients depressed for at least 6 months received medication at the proper therapeutic dose and duration, based on the clinical trial literature.⁴ We need to increase the rapidity with which people seek treatment for mental illness, and we also need to improve the rate of accurate diagnosis and proper treatment by all health professionals, psychiatrists included.

Frequently, the patient seeking specific psychiatric care in a managed care setting is counseled by a social worker and will only occasionally see a psychiatrist for a 15-minute "med check." While this may be the most effective treatment for some patients, many others will not receive optimal care. Of course, our public image does have something to do with this problem. Too often, when the general public thinks about psychiatry they envision a Freud-like figure who will silently listen to their troubles while they lie on a cold, stiff vinyl couch. There still remains a stigma to mental ill-

ness despite broad-based effects of campaigns by the NIMH and by patient advocacy groups such as the National Alliance for Mental Illness, the National Depressive and Manic Depressive Association, and the Anxiety Disorders Association of America.

Perhaps, educating our children within the school system is an appropriate next step. Suicide is the second leading cause of death in teenagers, and this rate of suicide in this age group has tripled in the last 3 decades. If teachers working at the elementary and junior high school levels can educate children about AIDS and substance abuse, mental illness should not be considered any more controversial. Teaching our children that mental illness is just that, an illness, like any other illness, would be a major step toward removing the stigma attached to these disorders. How many children are too afraid of mentioning depression or anxiety to their parents in fear of the dreaded word "crazy"? How many children even know how to explain feelings of depression or anxiety, or any feeling that is frightening or disorienting? If they are given some knowledge of mental illness at an early stage and understand that this type of illness is not something to hide or to be ashamed of, they will be much more likely to go to a parent or a teacher for help, should the need arise. It is likely that the rate of suicide could be reduced significantly if youngsters seek and are given medical intervention in the earliest stages of a mental disorder.

We must change the image of psychiatry to one based on the exciting advances in the area of pharmacology. We need to study and use components of psychotherapy better, to know which might be effective when used alone or in combination with medica-

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tion. It is becoming too easy for everyone to mask the psychological problems and treat only the biological symptoms. We must not allow psychiatrists to become mere overseers: managed care is economical but for the patient, and for the future of psychiatry, it may pose a real danger.

Where We're Going

How different will the future be for the medical students who graduate in the year 2018? Will society slow down? Will the environment suddenly become conducive to relaxation and provide us with clean air and pollutant-free food? Will daily living become less stressful? Will wars between nations or between races suddenly end as we acknowledge and deal with our aggression and prejudice? Will our genetic histories give us all a break? Not likely. It is more likely that we will continue to need, perhaps more than ever, physicians who can effectively treat a growing and overburdened population's increasing mental illnesses.

Practical, clinical experience has demonstrated the advantage of early diagnosis and treatment, especially as it relates to the recurrence of chronic disorders such as panic and depression; but do we want instant pharmacological intervention dispensed by a programmed machine? It is not too outrageous to believe, given the current health care economics as well as advances in technology, pharmacology and the neurosciences, that one day computers will diagnose and dispense medication. It is more than possible that persons suffering from major depression and experiencing severe symptoms, including suicidal ideation, may be treated by medication without ever speaking to a physician about the personal issues and life circumstances that have led to the particular depressive episode.

Impending changes in health care will give the federal government much more control over policy. It is my hope that we will be able to intensify research on why some segments of the population under stress do not become mentally ill and are capable of coping and adapting, while others manifest symptoms of various disorders. With an increasing emphasis on genetic and biology-based research, we may be too quick to misplace the blame for mental illness. Advances in the field of psychiatry are critical to the research and development of more efficacious and safe medication, but we cannot allow psychiatry to be too narrowly defined. The psychiatrists of the future will have a wealth of knowledge to draw upon from areas such as psychiatric genetics, neuropsychiatry, epidemiology and pharmacology: the psychiatrists of the future can have access to the best of both worlds,

biomedical and psychosocial. There need not be a —

Return to the supermall

Peter buys a can of soda, opens the bottle of pills, swishes one down, and leaves the store smiling. Twenty minutes later, Kate walks out into wind-driven November rain and, with trembling hands, opens the bottle of pills, swallows two, and waits anxiously for it to work. She runs to her car and fumbles with the keys. She must get home; she must be there to watch her children while they sleep, her husband will forget.

The APC could not see the look of despair in Kate's eyes or see the way she twisted the straps of her pocketbook as she waited for the screen to change. The APC could not reassure her with a smile, it could not take her hand and let her feel the warmth and caring of another human being.

A survey of the number of psychiatric residents in training in the US showed a 25% increase between the academic years of 1979 and 1989.⁵ However, the enormous changes in the structure of health care in the United States, including managed care and health care reform, have particularly affected the field of psychiatry. Psychiatrists must now work through contracts with insurers and health maintenance organizations that often do not allow psychiatrists to provide the patient with the best care possible. In large part due to these changes, it has been reported that since 1988 the number of medical graduates who go on to psychiatric training programs has decreased by almost 50% and that many academic departments across the country are struggling to remain solvent.⁶

My hope is that while streamlining health

costs we can still provide optimal care for the millions of people whose lives are damaged by mental illness. We must be allowed to develop more research studies to test the efficacy of continuing psychopharmacologic and psychotherapeutic treatments, and, if these treatments are shown to be effective, society must be willing to pay for them. There are miraculous new pharmacological agents now being developed that will help many to lead more fulfilling lives, but we must make certain that there is always a physician or health care worker available to look into a patient's eyes and see what technology cannot.

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Family Practice: A View From The Future

Larry Culpepper, MD, MPH

May 16, 2018

Dear Roxanne,

Granddaughter, what a wonderful surprise! I knew you had something special for the combined celebration of your college graduation and my 70th birthday, and I am delighted by your announcement that you plan on becoming a family physician. You asked me what it really means to be a family physician. Since we did not have time to talk before you and Bill left for Europe, please bear with my quaint old habit of writing letters. Family practice is a career of great variety and change, one that will forever challenge and humble you, and one that can fulfill or consume you.

The clinical content of family practice has changed since I finished medical school in 1973, most dramatically in the last 10 to 15 years. You may have heard of the "Epidemiologic Transition" that occurred in the early 1900s, during which infectious diseases were replaced by chronic diseases as the major cause of morbidity. In fact, this was an intermediate era necessitated by our lack of adequate understanding of the early causes of conditions, such as hypertension, diabetes, autoimmune diseases and neuropsychiatric disorders. As primary care and other research into early stages of illness, genetic and molecular biological research, and social and psychological theory all have advanced, chronic disease care has given way to health promotion and prevention. Primary care research also have given us the tools to apply these advances effectively in practice.

For example, I had a couple in the office last week with their 10-year-old—their youngster was well into puberty (I can remember when the average age of puberty was 13!). I still remember delivering her at the Blackstone Valley Birthing Center with our group's nurse midwife. We were going over her genotype disease penetrance profile. Based on her infancy gene-screen—one of the results of the Genome Project of the 1990s—we had a good understanding of her risk for several conditions. She was particularly susceptible to endocrine au-

toimmune conditions. The penetrance profile indicated that pubertal endocrine changes were increasing the likelihood of disease by early adulthood. Unfortunately, our understanding of polychromosomal-infectious disease interactions, and their immune system expression is still rather incomplete. Consequently the prediction had a margin of error that made decisions about preventive strategies difficult. I arranged for a family teleconference with an immune-geneticist in southern France who specializes in their child's profile, although I am biased toward watchful waiting in such cases.

But prevention is by no means all, or even the majority, of family practice. I have many patients with chronic diseases, although biomonitors has made their control both easier medically and more difficult behaviorally. Every day my biotechnician and I spend time reviewing the bioprofiles of my chronics panel, and one of the nurse clinicians and I then spend an hour or two tele-talking with patients. If need be we arrange a follow-up nurse clinician home visit.

You may remember Father Flaherty—he stopped over at Westport several times last summer. I saw him yesterday. When I told him of your announcement he asked me to tell you about him. He has an artificial knee due to osteoarthritis, an artificial pancreas and a reticular activating system stimulator, a consequence of a stroke several years ago. Every week he spends 15 minutes in his biomonitoring chair—he calls it his body's "electronic confessional"—while his transdermal biomonitoring units are recharged and his chair's telemetry unit receives monitoring output, which is sent to our BioTech 2200 Community Practice computer. For some cardiac patients, we receive 24-hour telemonitoring, although the new artificial hearts are increasingly making these obsolete if patients will accept them. Father Flaherty's risk of RAS system failure in the coming year has reached 6%, and we are discussing his options with the neurosurgeon tomorrow. He has been through several stimulator replacements—the early units had a high failure rate—and may decide not to go through it again. This is a most difficult part of being a family physician.

Acute conditions also lead to excitement—and make up an interesting part of practice. Infectious conditions still crop up.

Family practice is a career of great variety and change, one that will forever challenge and humble you, and one that can fulfill or consume you.

The super-resistant epidemics of the 00s fortunately are a thing of the past—and have left us with a healthy respect for antibiotics resistance. That, coupled with our evolving understanding of the immune system repercussions of new resistant organism-gene interactions finally led to the Antibiotic Control Act of 2015, whereby WHO removed most antibiotics from the open market. Our local community ID specialist does a wonderful job of monitoring bacterial and viral resistance patterns and is quite helpful when we need a controlled antibiotic.

"Controlled drugs" when you were born were the psychoactives—at one time a major source of societal dissonance. Only with the neurochemistry and behavioral breakthroughs of the 00s did we come to an understanding of dependency conditions. I still have a few resistant patients in my practice, who chose dependency. Watching their sad lives slowly extinguish is a hard part of family practice. At least we can relieve some suffering, and the vast majority of those who at one time would be addicts respond well to newer classes of neuro-gene therapies plus social counseling techniques.

Communication, communication, communication. This will be critical to your success as a family physician. I spend most of the day talking to patients, families and consultants. Given the time we spend on the telemonitor, you would think family doctors were all latent teenagers!

The BioTech 2200 unit, based on the new 4 gigabyte RAM chips, is our practice workhorse. It stores all of our practice families' records. Given their personal and family security codes, it can use World MedNet to construct the life histories of new patients, including their susceptibility profiles based on their parental, sibling and children's information. (Getting rid of insurance companies in the mid-00s was a big step in working out confidentiality issues for World MedNet.) The BioTech 2200 has the entire National Library of Medicine and a directory of regional and world super-specialists in memory, updated daily. Its decision routines are really helpful to an old codger like me. If I'm missing something its pattern autoscan of patient records picks it up, reviews similar cases and constructs an educational module for me to watch. By the

Larry Culpepper, MD, M.P.H. is a professor in the Brown Department of Family Medicine. He will be 70 in May 2018. He does not have grandchildren (yet).

way, in honor of your decision, I've reprogrammed its "teacher image" and voice to be you!

Anyway, using the BioTech's split screen telecommunication capability, I spend several hours talking with patients and consultants each day including sharing laboratory data and imaging. Except for acute televisits, I try to do these in the morning. That way if a nurse clinician (my 3 partners and I work with 8) needs to make a home visit, this can be arranged for the afternoon.

This afternoon for example, Martina visited a 3rd-year-old with recurrent abdominal pain. She used the BioTech portable, and we discussed the child by tele while she was at the home. The new 3D portable ultrasound BioTech module was helpful—no fecalith was visible in the appendix, and regional nodes weren't enlarged. That, plus some portable chemistries, led us to a working diagnosis of a behavioral problem. Before she left the family, Martina downloaded parent and child intervention videos, including one on potty training, and will check back next week.

The social marketing medical products are all new since the turn of the century. For instance this child's video will use images of foods, clothing and furniture familiar to the 3-year-old based on a scan of the parent's Visa account. Later Martina visited an old gentleman whose biomonitor had reported an increase in near-falls and some weight loss. Turns out he and his wife had a spat, and he was not eating. She straightened things out between them, and I reinforced her instructions by tele. She also inserted a diet diary and reminder into their kitchen video center. Its conversational interface makes this a valuable way to get behavioral data we just didn't have a few years ago.

In the office I see about 10 patients a day, and usually stop by the community procedural and intensive care facility or make a home visit on my way home. These face-to-face visits are special, and go to the heart of being a family doctor. Illness and debility are tremendously isolating experiences. Particularly when the illness is unnamed, the sufferer may feel uniquely alone and cut off from family and humankind. The Visit, including the physical contact of the exam, giving the illness a name, and even if cure is not possible, discussing a plan of care all let the patient know they are not alone. Such caring is often the start of functional recovery. For new families in my practice, establishing a bond of caring, through which they come to understand that I and my colleagues know them and will be there in case of serious illness, is an essential goal of visits.

For other patients, particularly the elderly, and those—possibly like Father Flaher-

ty—who choose to forego further interventions, the family doctor is critical. For them, we bear witness to their lives and suffering, promise help with pain, and hold the promise that they will not be alone in the journey on which their illness takes them.

We often are the main link to humanity for such patients and their families. They get comfort from knowing that we have been down such paths before—whether it ends in death or remission. Such recognition also affirms their dignity and sense of connectedness with others. It also instills confidence in the vast specialty consultation resources we may bring in. Confidence and trust in the professional nature of such relationships leads individuals and families to share their most intimate secrets, shames, ambitions and joys and to open their bodies and minds to us in ways they may not, even in their most intimate personal relationships. This privilege forever sets us a little apart from others in society. You'll find it essential to look inward frequently and to maintain a balanced and positive personal life in order to be neither overwhelmed nor abused by this privilege. I'm delighted that Bill is such a wonderful mate for you! Don't ever neglect to work on this relationship.

Organization. Management. Information Management. Your medical school courses on these may seem fluff, but they are skills that will make or break you in practice. They also are essential if you are to fulfill your responsibility in the community. In our practice Ann Dunn is our full time information manager. She's a whiz at working the BioTech 2200 community profiles.

The acceptance of universal sign-up of the population with a responsible family physician in 2005 led to revitalization of public health and community responsibility for our profession. Now, you can't even imagine the daily absurdities of practicing without a defined population base. Our practice, with 4 partners and 8 nurse clinicians, is responsible for about 18,000 people. The community computer interconnect with the 8 other groups in the Blackstone Valley lets us monitor disease and risks and coordinate interventions. This has revolutionized school and occupational health, and is a fun part of practice!

Do you remember Mrs. T and her kids—you baby-sat for them when you were 15. Her kids and 5 other kids in the neighborhood, a number of whom didn't know each other, all came down with gamma strep last year. Ann spotted the pattern of sore throats calls/visits on the community net right away, and we checked it out with cultures: To shorten a long story, Mrs. T had gotten a new puppy, and it turned out to be the common carrier! The pup had been a real hit

in the neighborhood and was known by the kids for its "great slurpy licks!" Amazingly the BioTech had listed dogs as a possible vector, based on a *NEJM* letter from the 1980s and found 4 World MedNet super-consultants that specialize in "canine transmitted" epidemics. We handled it by ourselves but logged a report with them any way.

Ann also takes charge of spotting our practice MIAs. A lot of our young families get stressed out and forget their kids' penetrance profiling or prevention checks. These are easy to take care of with teleprompts or nurse outreach. But Ann also spots the teens that have forgotten their annual contraceptives and chronic patients that are off their schedules. She also monitors the daily check-ins for the frail elderly and is great at spotting changes in activity levels that might signal incipient debility. She found 3 elderly new onset depressions just from seeing a decrease in their going out and weight loss this past month! Using the BioTech's region-scan feature she is always alerting us to viral waves that are going to pass through, and their projected severity impact rating for our COPDers and other chronics.

Team and Network management are other big ticket skills for family practice. Like it or not, family docs are looked to for professional leadership in the community—you'll be expected to maintain effective relationships with the school and family center, the elder care groups, the developmental, disability teams, and the ICU follow-up staff in the community, and help orchestrate their care of high need families. While infomanagement helps, a lot of it still comes down to peoplework. Given how you handle your mom, dad, grandmother and me, you'll have no problem with this! In fact, given your skill with people and your ability to fix anything, you're a natural for the high tech high touch of modern family practice.

Well, enough for now. You have another 90 years to discover what family practice is really like! Grams wants to look at a condo that's opening up at Hospital Condos. I'm not terribly enthused—I can remember when it was "Rhode Island Hospital" before the old hospitals were replaced by the small community ICUs in the late 00s.

Our love to both you and Bill,

Gramp

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The Specialty of Pathology in 2018

Don B. Singer, MD

The medical discipline of pathology is dually anchored in scholarly activity and applied diagnosis through the examination of organs, tissues, cells and fluids. As in other fields of medicine, pathology has been profoundly influenced by the geometric expansion of technical capability. Technical advances are predicted to continue into the 21st century. How will pathology look in 20 to 25 years?

Picture this. It's a blustery March day in 2018. Snow has not completely melted from the blizzard of February 6, the heaviest single-day snowfall in 40 years. John Provencer, a junior at the Brown University School of Medicine, knocks at the door of Dr Alice Davis, senior staff pathologist at University/Southeastern New England Regional Medical Laboratories (U/SENERM Labs).

"Excuse me, Dr Davis. Can I talk to you for a minute?"

"Sure, John, come in. What's on your mind?"

"I've been working here in the summers since I started in the Brown Program in Medical Education. But I wasn't really thinking of a career in pathology until recently. This year, I found the clerkships in invasive care and in noninvasive care very interesting, but physicians in all these rotations don't seem complete to me. They need something else."

"Hmm. What's that?"

"Well, they can go only so far with histories and physicals. Even the bedside MRIs can't solve all the problems. We've used them for almost 10 years now, and we still have errors of interpretation."

"John, that sounds so familiar. I believe I made a similar comment back in the early '90s when I was a senior at Brown. But imagists have come a long way since then. So have the invasivists and noninvasivists. It seems that pathologists are the only hold-over from the old days."

"Yes, Dr Davis, but I think I know the

reason. Look at how all the other physicians depend on pathologists. The evolution of laboratory sciences has really been remarkable. I've been reading a bit in medical history books. I didn't realize, for example, that the human genome project started as recently as 1990. That's only 3 years before I was born. Now the entire genome is known. The Comprehensive Genetics Laboratory here at U/SENERM Labs can pinpoint gene defects in a matter of hours, and appropriate gene therapy can begin the same day."

"Yes, John. That is amazing. We thought diagnosis and the treatment would be a lot more difficult than it has turned out to be. I couldn't have imagined as little as 15 years ago how easy it would be to replace a faulty gene with ordinary, simple, nonorganic vectors taken orally."

"Dr Davis, you're giving too much credit to the therapists. It was your work in 2008 that made it possible for the therapists to achieve what they have. I read of that work in an old copy of RHODE ISLAND MEDICINE in the Hard Copy Section of the Sciences Library. The challenging part is diagnosis and establishing mechanisms of disease. That's why I'm thinking of pathology as a career choice."

"John, I think you would make a good pathologist. Tell me more."

"I'm doing an elective with Dr Goethe in the Pathology Department at Brown. She is developing an animal model to study the variables of senility. The project she assigned to me was the role of trace metals in the pre-senile changes of articular cartilage. To say that I am turned on to research is the understatement of the day. I've already developed my own series of experiments using a combination of molecular genetics and morphometric analysis. Just last week, I added a few picomoles of zinc chloride to an explant of murine femoral-cartilage and accelerated mineralization of the matrix 10-fold! Yet in the intact mouse, oral or subcutaneous zinc chloride doesn't produce the same result; the reasons for the difference will be the subject of my next few experiments."

"John, you are obviously animated by that research, no pun intended. Dr Goethe is lucky to have assigned these projects to you. I hope you will continue to pursue the

The Comprehensive Genetics Laboratory at U/SENERM Labs can pinpoint gene defects in a matter of hours and appropriate gene therapy can begin the same day.

experiments and get to the bottom of the problems. Solutions to such riddles are some of the real joys of academic pathology. Do you think a career in research is what you are aiming for?"

"I'm not going to make up my mind just yet. I want to learn more about service pathology. We don't get much exposure to this side of the field in the first 2 years of medical school."

"Thus it has always been. What else?" asked Dr Davis.

"The evaluation of tissue samples can now be so much more comprehensive than in the old days."

"What do you mean by 'old days'?"

"When you first started training, the optical and electron microscopes were fairly limited in their usefulness. You had to use a battery of stains, and all those slides could fill a large tray. Technicians could spend hours preparing the slides and grids, and you might spend hours poring over them, one at a time. Yes, you could identify various microorganisms in some cases. And yes, in other cases you could narrow the diagnosis somewhat. With immunologic techniques, specific proteins and haptens could be visualized in cells and tissues. But each special stain would have to be ordered one at a time. It sometimes took days to get all the specimens properly prepared, especially if you wanted to examine the ultra-structure."

"Now you have the omniscope and the omnistain. With the variable electromagnetic wave source and computerized filters, the pathologist can excite the appropriate agent in the omnistain almost immediately. The images projected on the high-resolution television monitor sometimes shout out the diagnosis for you. When they don't, you still have a good idea of how to proceed to the exact diagnosis. What amazes me even more is the rapidity with which the tissue is prepared. From a tiny biopsy or skinny-needle sample, you don't even have to use a microtome. Just put the specimen in the microcassette, dip it a few seconds in omnistain, and put it in the omniscope. Larger surgical specimens and biopsies can be cut thin enough with a scalpel blade and examined the same way. The confocal channel on the omniscope makes it possible to

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examine planes as thin as a few microns or even a few Angstroms!"

"Well, John, you really have been studying ancient history to know about the optical microscope. We used to have to sit at a scope with 8 or 10 binocular heads to teach microscopic pathology to students or residents or to show the invasivists what we thought of the tissue they removed. Now we simply transmit the images and interpretations by telemetry right into the procedure room or the attending physician's office."

"You know, Dr Davis, that's very useful to the attendings and clinical residents. When I rotated in the clinical services, we really appreciated the immediate input."

"I do know that, of course. And we can leave the image and message recorded on their monitors for later viewing, if necessary. The verbal messages are automatically converted by the voice recognition devices to hard copy or to electronically written messages. These can be transmitted to the patient's life medical record card, to the physician's office computer, or to the hospital's medical record library. Bills are automatically generated in U/SENERM Labs fiscal office. All this happens in the 30 minutes after the specimen enters the lab from the electronic grid transport carrier."

"Dr Davis, I spent some time over in the Pathology Department at the University/Regional Hospital last week to review the autopsy record of a patient I had when I was on the noninvasive clerkship. Some old protocols had been found in the hard-copy cabinet and were out on the table. You had done a couple of those autopsies as a resident. I was amazed at how much you could learn without postmortem imaging and blood/body fluid analyses. But you had to do a complete gross dissection in each case. After an initial course in anatomy, none of us, not even invasivists, do that thorough a gross dissection."

"Sure, John, but in 1994, every resident did what we called a complete autopsy in every case. We didn't have access to MRIs, CAT scans, and the instruments to do biopsies, or blood/body fluid analyses that we have today. Even now, a 1st-year resident in pathology still must do complete dissections on two adult males, two adult females, two fetuses and two infants."

"Why go to all that trouble when imaging techniques show the anatomy so well and direct the pathologist to the appropriate lesions to biopsy?"

"Well, John. Think of it this way. Aside from the anatomy staff at the medical school, only pathologists and maximum invasivists still have sufficient skills in practical anatomy to help minimal invasivists and noninvasivists when there is a need to sample a

specimen. Use of imaging instruments and flexible laparoscopes, endoscopes, thorascopes, cranioscopes, and intravascular catheter/scopes have made the patients more comfortable and have reduced impatient stays to a minimum. Even though we use all these instruments now in the majority of our autopsy exams, we need to maintain the necessary skill and knowledge of anatomy when the circumstances demand more radical invasive procedures."

"I see. The invasivists shouldn't have to call the medical school to find help from an academic anatomist. The pathologist is often right there in the same building."

"Exactly."

"What about blood-body fluid analysis?"

"Well, John, we've come figurative light years along in the past 2 or 3 decades. This laboratory, U/SENERM Labs, serves all of the hospitals and physicians' offices in Rhode Island and nearby Massachusetts and Connecticut. We have about 2 million patients in our files, which is the entire population of the region. Our B/BF (Blood/Body Fluid) analyzer can perform any or all of nearly 5000 analytes on 2000 specimens per hour and the entire support laboratory occupies only about 10,000 square feet of space. That was about as much space as even a small hospital had 25 years ago. Most of that hospital lab space has been converted to other use now."

"How did the system work in the '90s when medical practice began to change?"

"Each hospital had its own laboratory. Those labs and dozens of private laboratories served the private physicians' offices throughout the state and the region. As physicians began to join larger and larger groups, laboratories consolidated more and more. The ultimate consolidation is what you see now, right here; the U/SENERM Laboratory."

"You mean that each of those dozens of labs had a B/BF analyzer?"

"No. It was far more cumbersome and complicated than that. Each lab had dozens of instruments. Some were capable of performing only one or two kinds of analyses. Computerization and miniaturization were in their infancy then. I remember how proud we were to have an analyzer called the SSAM that could take a single sample of serum and measure about 80 different analytes; you could select among the 80 which ones you wanted and the results would be printed out or sent to the lab computer in a matter of a few minutes. But first you had to centrifuge the blood to separate the serum from the formed elements. By today's standards, it was really cumbersome."

"What did SSAM stand for?"

"Selected serum analyte measurement.

It was pretty crude, but we thought it was great then," explained Dr Davis.

"Each hospital still has its own laboratory now. How do you account for that?"

"Consolidation of laboratory testing is good for almost every circumstance, but emergencies still require immediate analysis of blood or body fluids. Technologists and technicians staff each hospital and work at several other locations in the region to perform these tests. Experienced technical analysts travel to nursing homes and to patients' homes as the need arises. They are similar to the visiting nurses. With the Point-of-Care analyzers, they can perform about 100 different tests. Most of these are done with transcutaneous or trans-mucous-membranous analysis. In most instances, the patient doesn't even need to have a needle stick."

"What about trauma cases and big procedures with maximum invasion? It doesn't seem possible to serve those patients quickly enough from the centralized lab, what with replacing blood loss and other requirements."

"You're right," said Dr Davis. For most of those cases, P-O-C analysis suffices. As for transfusions, fortunately, we no longer are bound by the need for donated human blood. The various fluorolyte fluids now can replace blood loss without the hazards of reactions or infections. The bio-degradable fluorolyte micropellets do a remarkably clever job of mimicking red blood cells. The availability of several grades of micropellets with different oxygen affinity coefficients has sure made life easy for the transfusionists. You can't begin to imagine the anxiety that we experienced when we used human blood to replace blood loss or to treat anemias. HIV was only one of the hazards. Of course, now we have a cure for HIV, but it was a very scary disease back in the '90s. And then there were the blood shortages that occurred around every holiday. I have to shudder when I remember those days!"

"Yes. And then, you didn't routinely save cord blood samples. I know that if I ever need natural blood replacement, my cord blood sample is stored in my hometown cryogenic depot. An aliquot can be prepared for growth of erythroids or granulocytes or megakaryocytes—what have you. All that needs to be done is to put in the proper growth factors," said John.

"That's right. I guess you have a sample of your fibroblasts stored away, too."

"Indeed I do. You never know when fate will deal you a blow that requires new tissue to repair damage or disease. Well, I've taken up enough of your time, Dr Davis. Maybe I could drop in sometime soon to

review the training programs in pathology that you would recommend."

"Anytime, John. Don't wait too long, though. Remember, there are only 30 training programs in the country. The number of positions for resident pathologists has been reduced to 200 per year since the new technologies have been in place. It takes only 2

years to qualify for board examination now that we use the omniscope and the B/BI analyzer. Pathology is a highly competitive field. You can be sure, though, that I will give you a strong recommendation to a good program. I hope you will consider coming to ours at Brown / U/SENERM Labs."

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Infectious Diseases 25 Years into the Future

Dennis J. Mikolich, MD, and Stephen H. Zinner, MD

In 25 years many changes will have developed in our ecosystem, most of which likely will affect all living creatures that interact with microorganisms. The ecological balance may tilt, and some species will die off. Others will thrive. This has already been a familiar paradigm for viruses, which are elemental survivors often emerging first in a zoonotic environment with subsequent adaptation for humans. In the past year in many parts of the US (including Providence) this has been dramatically demonstrated by the Hanta Virus, a deadly organism common to rodents but now responsible for a highly lethal respiratory disease in humans with no apparent cure.

Many more viruses with lethal potential surely exist in the world, and they will emerge from their hidden niches in animals, in rain forests and other habitats as a result of continued deforestation, land abuse, global population expansion, ozone depletion, and other pollution. Machupo virus, a deadly hemorrhagic agent from Bolivia and Ebola virus from Zaire, among the infectious agents with the highest human mortality rates, already are classic examples.

The human immunodeficiency virus, possibly originating in central Africa, also may have been transferred to humans from a zoonotic focus and is another familiar example of a new pathogen with deadly potential for enormous destruction of human life. How changes in ecosystems encouraged the emergence of this agent remains to be elucidated, but it is highly likely that this virus, more difficult to transmit than influenza, will result in a chronic illness with worldwide distribution and might even be associated with new modes of transmission currently unimaginable.

First described in 1981, HIV has infected about 1 million Americans and 12 million persons globally. With more infected people expected and given the well described ability of this retrovirus to mutate its surface antigens, the impact on humankind will certainly be monumentally disastrous. Incursions of this virus in all levels of society in all nations of the world will likely continue absent the development of new treatments or vaccines. However, it is possible that viral mutation could work in our favor and permit a beneficial response in infected hosts that might result in a more benign chronic illness allowing physicians to provide long-term continual monitoring and support.

Sexual behavior already has changed in response to this infection. More draconian and universal changes in behavior are likely to follow, and it is hoped the wisdom of policy-makers and clergy will evolve to meet the increasing challenge posed by this unwelcome viral pestilence. Let's hope enlightenment doesn't really take 25 years!

As a result of new molecularly based diagnostic techniques, such as the now familiar polymerase chain reaction (PCR) and other nucleic acid amplification technologies, many human diseases now of unknown etiology will be associated with causal microorganisms and our knowledge of the natural ecology of human microbial pathogens will expand logarithmically. Molecular techniques have already provided the causative agent of Whipple's disease with the use of bacterial ribosomal RNA sequencing from tissues of infected patients, revealing an actinomycete distantly related to *Nocardia* and *Mycobacteria* sp. The identification of the causative agent of bacillary angiomatosis and peliosis hepatis, *Rochalimaea henselae*, is another cogent example. Many currently extant microorganisms will be identified clinically without the need for culture with enhanced development of molecular techniques stimulated by the discovery of *Rochalimaea* and other newly found organisms. Also, DNA probing for sexually transmitted diseases and other infections in the field under prim-

It is entirely possible that in 25 years the scourge of humanity will not be a new unnamed virus or mold, but the familiar pneumococcus or staphylococcus.

itive conditions will become a reality.

Predictably, among others, sarcoidosis, Crohn's disease, ulcerative colitis, rheumatoid arthritis, scleroderma, polyarteritis, Hodgkin disease, leukemia, many cancers, and possibly some forms of coronary artery disease will yield to the identification of their causative infecting organisms, enhancing the possibility for protective vaccine development. We might even have a microbial cause for chronic fatigue syndrome.

The harbinger of disaster on the bacterial front has already been sounded by the pundits at *Newsweek*. Antibiotic resistance currently promises to destroy the golden age of infectious disease by allowing the emergence of more common infecting bacteria for which there are no effective antibacterial agents. Even now we face serious infections with enterococci and tubercle bacilli for which we have no effective therapeutic agents. The microbial information highway will continue to develop, and bacteria will always be able to outsmart their assailants. Unless physicians really learn the appropriate use of antimicrobials, unless infection control measures are applied with vigor, unless the pharmaceutical industry is able to devote resources to develop new molecules (and one downside risk of overzealous control and cost containment in health care reform is that they will not), then we will not need the emergence of new pathogens from their ecological niches to lose ground gained over the past 50 years.

It is entirely possible that in 25 years the scourge of humanity will not be a new unnamed virus or mold, but the familiar pneumococcus or staphylococcus so well known to our medical grandparents but now born again with new vigor thanks to antibiotic resistance. Complacency and carelessness may give way to premature obsolescence of our most precious wonder drugs. (History does have a tendency to repeat, and we do have a learning opportunity here.)

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As our therapies for cancer intensify and as our immunological and surgical colleagues develop ever more bold immunosuppression and daring procedures, nosocomial infections will continue. We certainly will ever be at battle with yeasts and molds now thought to be harmless, and we will encourage friendly bacteria to turn foe. We can hope that hospitals will become more user friendly, smaller and more efficient. Home care will allow for more treatments, and new formulations of anti-infective agents will emerge to support this trend.

Vaccine development in 25 years will

most likely offer protection against all “childhood infections” and diphtheria, polio, pertussis, measles, mumps, whooping cough, and tetanus should truly be eradicated, provided the public health infrastructure is not allowed to deteriorate as health care dollars become ever more scarce. New technology should amplify protection against tuberculosis, hepatitis, malaria, cholera and other infectious diarrhea, Lyme disease, gonorrhea, syphilis and HIV.

Infectious diseases have been with Earth since its first inhabitants. It is likely they will always be with us. Another quarter

century of research, prudent prevention, education and effective health care should allow quantum leaps in their eradication and control. Our survival as a planet depends on it.

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Health Care Organization and Financing, 1993–2018

Albert F. Wessen, PhD

The following scenario is but one, hopefully not too implausible, description of what might happen to America and its health care system during the next 25 years. Perhaps it should best be read as a “cautionary fantasy.”

In 2018, historians looked back—if at all—upon the controversies and legislative compromises that produced the Modified Clinton Health Care Plan of 1995 as but a small chapter in a century-long attempt to provide access to health care for all Americans. Given the tumultuous economic struggles faced by the nation as it attempted to defend its prosperity and world leadership against what the 20th century called “Third World nations,” this lack of attention to affairs of the mid-90s was not surprising.

Many of the problems facing America in 1993 were still unsolved—and in many cases had worsened—by 2018. Global competition and the continuing (although narrowing) discrepancy between labor costs in this country and the Far East led to incessant efforts by American industry to increase productivity, often at the price of yet another round of lay-offs. Even though in many areas Americans retained a technological edge, the gap progressively narrowed—and technological innovation largely led neither to many new jobs nor to consumer products that the public preferred over imported goods. One result, of course, was a stubborn tendency toward negative trade balances and increased external debt (despite a recurrent spate of unsuccessful attempts at protectionist trade wars). In America as well as Europe, the proportion of

adults in the work force continued to shrink.

Argument about social policy turned around how to maintain a well-functioning society when paid employment had become increasingly the attributes of a minority. This situation, of course, led to continuing and increasing disparities in income between the well-educated and successful minority and an insecure and hard-pressed majority. Americans looked wistfully back at the days when they could think themselves to be the leader in prosperity and in world politics.

Naturally, these problems with the global economy engendered both constant conflict and ineffectual legislation at both federal and state levels. Since job losses continued, the problem of welfare seemed unsolvable. And despite what were seen by critics to be recurrent Draconian budget cuts, the federal deficit stubbornly refused to wither away—this despite the passage of a balanced budget amendment in 1997, which was made more stringent in 2002; so Americans faced both recurrent tax increases and the constant specter of inflation. Neither conservative prescriptions of free market, monetarist and libertarian solutions nor liberal/radical approaches such as a “cooperative commonwealth” and a “managed economy for equity” were able to overcome apparently intractable structural problems.

All was not bleak, however. Zero population growth had been achieved in the US before 2000, and in 2018 it was confidently predicted that even in Africa and India it would be attained by 2025. As the President indicated in her State of the Union message:

Providentially, for the first time in human history there have been no wars anywhere in the world during the last 8 years. At last, we see hope of overcoming the threats to our global resource base. Then, finally, we shall be able to give our environment the

... it became increasingly clear that under either a regime of competition in the marketplace or one of government financing and regulation of health care, the results were the same: problems of access, equity, cost and quality of care remained unresolved.

care it deserves. And this will lead to a renewal of the bounties of nature for the good of all people everywhere.

Although the end of the population explosion reduced the danger of “environmental suicide” and promised to mitigate economic competition within the global economy, it also brought with it an escalation in the aging of the population. Despite the fact that life expectancy leveled off after 2005 and actually dipped a bit after 2015,* the overall proportion of the aged continued to increase. After 2010, the Census Bureau defined the elderly as those who were 75 and over—and in 2015, it was estimated that they numbered no less than 15% of the population. Of this number, about a tenth resided in rest homes. While gerontologists were enthusiastic that more older people than ever before remained fit and competent, the economists noted that the costs of maintaining them so continued to increase.

Medical technology had continued to offer more possibilities for biological—and genetic—interventions. Although after 2000 the rate of innovations leveled off and then declined because of a reduced pool of research and development funds, the choices available to treat the sick and infirm of almost every diagnosis continued to increase. But the continually escalating cost of new treatment and prevention modalities forced both providers and their clients to assess carefully their ability to use the best. In short, for the wealthy minority, the med-

* After implementation of the “end-of-life” constraint on Medicare.

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ical smorgasbord was readily available, heaped with many options. On the other hand, the basic care provided to the population as a whole was in practice not available to some and offered only hard choices to many others.

The Modified Clinton Health Plan of 1995 had mandated a uniform and generous set of health care benefits to Americans joining the plan. However, these benefits were to become universal only by 2003, and neither an employer mandate nor a legal requirement for adults to join the system had been enacted into law. By 2000, it was reported that 80% of the population was covered under the Plan, leaving some 50 million either without health insurance or with less coverage than promised by the plan. And, since it had been deemed necessary for the government to subsidize premiums for those with less than median family incomes, the pressure on both federal and state budgets was incessant.

The 1995 Modified Clinton Health plan did not include cost controls on either insurers or providers, although it did cut benefits available to those on Medicare. Accordingly, medical care costs continued to increase at higher than the overall inflation rate despite the ever more pervasive and vigilant attempts of those in charge of managed care plans to impose more efficient choices. This was thought to be the result of the increasing demands of an aging population for increasingly sophisticated medical care. Often, however, this expensive care represented half-way technologies that prolonged life but entailed lengthy rehabilitative and supportive regimens for their recipients.

By the election of 2004, the candidates of both parties agreed that the Modified Clinton Plan of 1995 had been a failure—but as usual, they disagreed on what should replace it. With modified managed competition in disrepute, the choice seemed to be either the previously unfeasible single-payer plan or deregulation that would remove most of the management from managed competition. Given the public's dissatisfaction with continued problems in obtaining adequate insurance, the advocates of the single-payer plan won the election, and the states (by federal mandate) replaced the insurance companies as the payers for medical care. Global budgeting and capitation—and acrimonious negotiations between the states and various provider organizations—became the order of the day. This culminated in the infamous general strike of physicians in 2008, one result of which was the break-up of the AMA into a variety of different physician-interest groups. However, no solution to the structural problems

of health economics was found.

The medical care industry remained largely within the private sector. Both vertical and horizontal integration of health care had taken place on a large scale. However, the prophecies of the early '90s that most health care would be provided through a handful of mega-corporations was not fulfilled. Several large insurance companies had developed nationwide provider networks and invested heavily in the further development of these after the passage of the single-payer plan. But difficulties with the adequacy of governmental reimbursement and the ability of a variety of local networks to undercut the mega-corporations prices led to the partial withdrawal of the latter from the health sector by 2010.

Managed care and integrated networks, the bellwether developments of the '90s, continued to thrive and grow. The continuing development of sophisticated medical (and management) information systems accentuated the ability of program coordinators to regulate the terms and conditions of health care—most often to the presumed benefit of the managers bottom line. The standardization of medical care through computerized diagnosis and protocol-driven care was seen by many physicians and health experts as the only way to assure quality of care at an affordable price. Unhappily, save for the minority of management-oriented physicians who were able to determine the nature of computer-guided decision making, the result was increasing unhappiness among practicing physicians—and a sharp decline in applications for medical school seen after the turn of the century was attributed to many to this sort of rationalization^{***} of the field. Such standardization of clinical medicine, however, did lead to great growth in the number of clinical practitioners (as community college-trained health workers were called), and in many areas, they were the only available group to whom patients could turn.

The trend toward providing even the most sophisticated forms of medical care outside the hospital continued—and by 2018 there were only 500 in-patient clinical facilities in the country. These hospitals were largely devoted to diagnosis, genetic therapy, and experimental treatment of new families of hitherto unknown diseases and syndromes related to changing environmental stresses. (AIDS was but the first of these new entities.) Therapy for many of the various cancers, which in 1993 were vexing

^{***} Many physicians ruefully agreed that they had become the wealthiest "proletarians" of the 21st century!

problems, had become largely routine and was undertaken on an out-patient basis. But for many, treatment left residual disability, and prolonged rehabilitation was the order of the day for those who could afford it.

Arguments continued about the most desirable and efficient way to reimburse the care-givers, who were amalgamated into a variety of quasi-independent, free-standing associations. A minority of services and providers continued to demand reimbursement on a fee-for-service basis—and if their skills were esoteric enough, their demands were grudgingly met. But most providers were salaried, and most managed care networks offered care (whether provided directly or on a contract basis) on a pre-paid capitation basis.

It became increasingly clear that under either a regime of competition in the marketplace or one of governmental financing and regulation of health care, the results were the same: problems of access, equity, cost and quality of care remained unresolved. The plethora of enterprises involved in the health care industry—research institutes, educational institutions, pharmaceutical companies, appliance manufacturers, software and communications network companies, care centers, claims adjusters, health lawyers, network managers, and providers of the many forms of direct care—continued to compete to maximize their market shares and their profits. Under whatever mode of financing and control had been instituted, managerial skills and loyalty were directed to the marketing of health care products and to the efficient management of human resources.^{***} Meanwhile, as these competing corporate entities prospered—or failed—the problem of delivering humane and quality care to all was never completely solved. And providers—whether physicians or clinical practitioners—worried about their ability to help their patients in the best way that they had been taught.

So it was that in her State of the Union message of 2018, the President—having indulged in a bit of historical research—found President Clinton's six goals for health care still unreached. But she was also able to

^{***} Whereas in 1940, the complexity of medical care was described in terms of the length of a myocardial infarction patient's chart and the numbers of personnel who contributed to it, in 2018 it was noted that the value-added tax applied to the care of such a patient typically involved assessments on no fewer than 31 separate manufacturers, wholesalers, coordinators or providers.

suggest that all the attempts at legislative solutions of the health care problem had failed for one important reason. America in 2018 had not yet fully realized that the purpose of the healing professions (and industries!) must always be service rather

than profit and that their agendas must be defined in terms of dedication to patients rather than to individual or group aggrandizement. It remained to be seen whether the President's discovery would be widely shared and acted upon.

Of Milestones and Millstones

Newell E. Warde, PhD, and Charles B. Kahn, MD

Demographics will rule the 21st century. By 2018, the human and ecological consequences of world population trends will have globally transformed medicine, education, law, international relations, public policy, and private morality. The population explosion will affect developing nations most immediately, but American institutions and perceptions of the world also will be changed profoundly by demographic trends.

World population will increase by 30% between now and 2018, approaching 8 billion souls by then. Progressive degradation of arable land will lead to a decline in world food production by nearly 20% during the same period. Inadequacies in clean water supplies, energy supplies, nutrition, sanitation, shelter and clothing will lead to sharp rises in human morbidity and mortality, especially in Asia and Africa.

Secondary to these social stresses will come countless local and regional conflicts over water, energy sources and productive land. There will be mass migrations and huge refugee problems in some parts of the globe. Medicine, in more and more of the world including many urban areas of the United States, will focus increasingly on fundamental issues of human survival.

Dazzling advances in information technology will nurture awareness of these catastrophic trends. Americans will be bombarded with reports of human misery that are so graphic and immediate that no one will be able to ignore or dismiss them. Satellites and computers will construct detailed, apocalyptic projections of the consequences of a global population allowed to grow to 12 or 15 billion persons by the end

of the 21st century, that is, during the lifetimes of people born in 2018.

Although the developed nations of the northern hemisphere will be far less drastically affected (US population will grow by only 18% by 2018), the life experience of everyone will be modified by the developing global emergency. This awareness will shape prevailing thought in 2018.

Medicine, of course, will have contributed significantly to the emergency. World mortality rates plunged after 1960, thanks to immunization, antibiotics, and DDT. Advances in reproductive medicine, cardiac care, and organ transplantation have enhanced human fertility and longevity still further, and will continue to do so. The AIDS research that began in the 1980s will not only have resulted in an effective cure for that malady by 2005, but it will spin off a host of powerful new additions to the armamentarium available to combat disease.

Immunology will have made great strides, transforming cancer therapy and organ transplantation, yielding new antibiotics and antiviral therapies, and generally keeping a step ahead of most drug-resistant microbial strains as they develop. Other marvelous advances in biochemically directed drug therapies, oncogene suppression, carbon dioxide lasers, and artificial organs will come to seem almost pedestrian as the Human Genome Project progressively stretches our very ideas of medical care, preventive medicine—and medical costs.

The pathogen causing the mysterious Cranston Cellular Depletion Syndrome (CCDS), which primarily affects the cerebral cortex of politicians and judges in areas of southeastern New England, may still defy detection and therapeutic intervention in 2018 (could it be the water?), but the annals of clinical medicine will otherwise record new victories in the struggle against human disease and disability.

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... America's comparatively higher medical costs are more apparent than real and reflect failures not of the American health care system per se, but rather of other social systems in the US, especially those relating to education, literacy, housing, employment, and civil order.

Thus, the blessings of technical and medical progress will continue to defeat Malthusian forces that otherwise would have checked human population growth. By 2018, the tragic ironies of these blessings will confront us dramatically as an impending ecological calamity that will deeply influence prevailing attitudes about the limits of human life.

While the United States will not experience the same kind of catastrophic population growth and massive social dislocations as developing nations, demographic change nevertheless will have a particularly profound impact on American medicine by 2018. It will even threaten social and political cohesion in the US.

The seeds of this crisis were sown between 1945 and 1963. In 2015, the oldest baby boomers will turn 70. By the time the youngest boomers turn 80 about the year 2040, the US and other boomer nations will have seen their economies, their health care systems and the rest of their societies transformed. This massive wave of elderly people will not only make daunting demands upon the health care system, they will change the economics, politics, institutions, professional training, and even the ethics of medicine and health care.

Some of these changes will have their thinly disguised roots in generational resentment. Aging boomers will be perceived by younger Americans as belonging to one of two groups: 1) the still healthy boomers, who are locking up valuable jobs (for the Social Security System will be penniless by 2018, forcing many middle and lower income boomers to postpone retirement for years); or 2) the not-so-healthy boomers, who are bankrupting the Medicare Trust Fund, and their families as well.

Mandatory retirement will be illegal in any form, and this will be one of the most bitterly divisive issues of the day. Millions of boomers, voting what they say is their

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conscience, will stifle public policy changes on this and a whole range of other issues, many of them medical, that would otherwise shift scarce resources and public priorities toward younger generations at the expense of the elderly. A massively powerful AARP will actually spawn its own political party.

With the resulting paralysis of the political system, social cohesion will deteriorate. Violence against the elderly will rise to become the leading national health concern.

Ira Magaziner, who turns 71 in 2018, will launch an ambitious effort to promote a new social order in the US under the rubric "New Curriculum Vitae." Confused and mistrustful voters will ultimately reject this exquisitely complex and ingenious plan, by which market forces were to be channeled to marry cold fusion and warm superconductivity with the Fountain of Youth, thus eliding human death, at least at Ivy League institutions.

These inexorable demographic developments—the aging of the boomer nations coinciding fatefully with the deepening global environmental crisis—will lead to a world social ethic that will profoundly influence both the theory and the practice of medicine in the US. Stripped of its more elegant rationalizations, this newly pervasive

ethic will claim to favor quality over quantity of human life, both in terms of numbers of lives as well as length of life.

Those who believe in supreme beings will come to say that the creator of life gave us not only reproductive organs to be used, but brains, also to be used; moreover, when use of the former comes in conflict with the exercise of the latter, the brain must prevail, they will say.

Inseparable from this new ethic will be the view that human beings must accept responsibility for stewardship of the planet, for controlling their own numbers, and for managing their impact upon the earth for the sake of preserving it in the longer term as a place where humans and other animals have a chance to live out their lives with some semblance of grace, beauty and dignity, rather than as a place only of misery and desolation.

By 2018, largely as a result of this new social ethic, 48% of Americans will be strict vegetarians, and 25% of these will be vegan. Federal agricultural and tax policies will encourage vegetarianism as a matter of national security.

The new ethic, moreover, especially in its American inflection, will encourage aging boomers to exit quickly and quietly. Many boomers will want to do this anyway, and the legal, medical and social institu-

tions and practices of the day will actively facilitate their doing so. The more questionable aspects of Dr Kevorkian's activities in the 1990s will be selectively forgotten, and he will be widely revered as a pioneer and martyr for human rights, compassionate medical practice, and genuine spiritual insight.

Indeed, 20th century sensitivities and controversies associated with both the beginning and the end of human life will be eclipsed by concern about degradation of the planet under the weight of the human population explosion, even in those developed nations whose populations are relatively stable. Systematic rationing of scarce medical resources will become a self-understood and prominent feature of the health care system, as prevailing conceptions about the purposes and ends of medical care change.

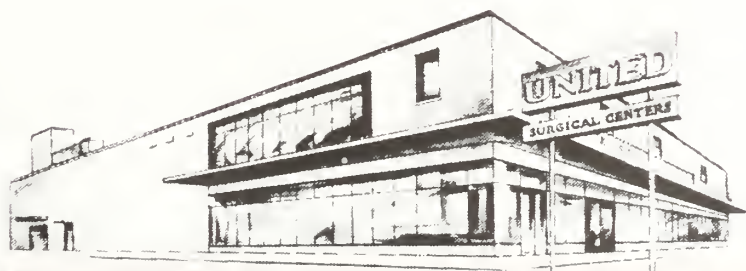
This change will have been facilitated by changes in medicine itself that are already clearly visible in *fin de siècle* America. The shifts will have become irreversible during the period 1993–2005, which historians will come to refer to as the "Clinton Metathesis," when the presidency of William Clinton is followed by the presidency of Hillary Rodham Clinton (who will become President Rodham following their divorce).

The early years of the Metathesis Era in

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America have brought great expectations for constructive change of the health care system, but many of the hopes will go unfulfilled. Instead of resolving major systemic problems, the general effect of these efforts will be to trade old problems for new ones.

Three ironies will be evident as Americans look back from the perspective of 2018:

The first irony will be that, while concern about costs drove the reform efforts of the early Metathesis Era, cost trends ultimately were about the only things *not* affected by the changes made. It turned out that the factors driving medical costs are essentially the same around the world, and democratic, technologically advanced societies are limited in their ability to deny beneficial medical care to their citizens. It will also become clear that America's comparatively higher medical costs are more apparent than real and reflect failures, not of the American health care system per se, but rather of other social systems in the US, especially those relating to education, literacy, housing, employment, and civil order.

The second irony will be that American government policies stifled the one strategy that, for a while, promised some relief from cost concerns. Health care was a great

American growth industry that created new jobs and new products, and it could have created new wealth for the US as an international export industry. The pharmaceutical industry led the way, supported by high levels of research and development, until the reforms of the 1990s stunted academic and clinical research. The mantle of leadership in these areas will have long since passed to the Germans and the Swiss by 2018.

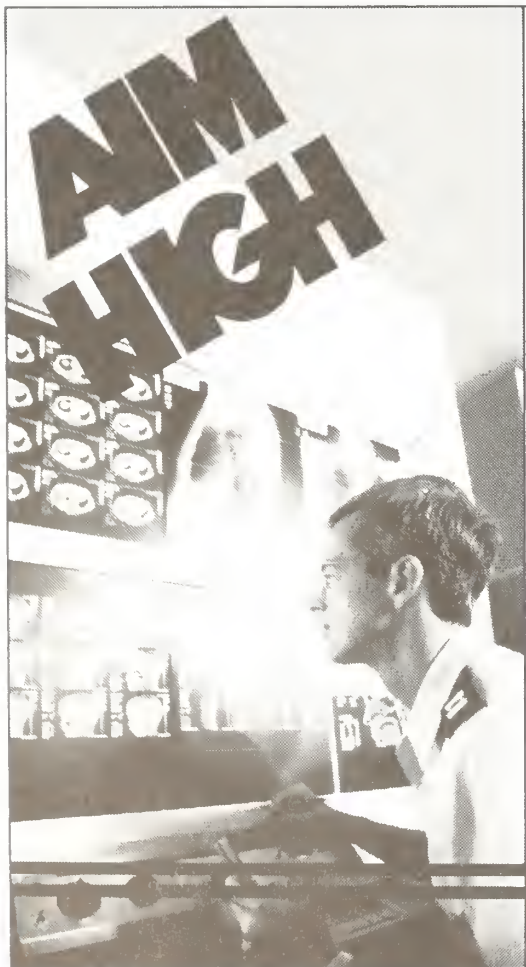
The third and most profound irony will be that reform efforts largely destroyed the unrecognized central pillar of the health care system: the professional ethic of medicine. Little noticed in the enthusiasm for "managed care," "managed competition," and anti-trust enforcement in the early 1990s was the unexamined premise that underlay these enthusiasms: that regardless of what profane pressures that might be placed upon physicians, their sacred professional ethic would preserve the quality of care delivered to patients. In other words, physicians could be freely recruited as double agents who balanced the interests of both patients and payers without disadvantage to either.

To an edifying degree, this article of faith proved to be surprisingly justified for many years. Inevitably, however, physi-

cians began to internalize what the Justice Department, the Federal Trade Commission, the Congress, state legislatures, the insurance conglomerates, and even (healthy) "consumers" had been telling them in many ways for years: that medicine is a business like any other, medical services are commodities like any others, and the practice of medicine is a skilled trade like any other—not a profession, and certainly not a sacred calling, Osler notwithstanding.

With the erosion of the professional ethic, there was little to slow American medicine's quick slide into becoming a highly regulated utility by the year 2018—little, that is, aside from certain national, state and local medical associations and societies, much diminished in membership but undiminished in their stubborn enthusiasm for the quaint ideal of the physician as advocate for the patient, first and last.

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Healthy Rhode Islanders 2000: A Public Health Agenda for the '90s

Barbara A. DeBuono, MD, MPH and the Governor's Task Force for Health Objectives for the Year 2000 for Rhode Island

Healthy Rhode Islanders 2000 presents a vision of a healthier future for all citizens of the state.

In September 1990, the US Department of Health and Human Services published *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*.¹ Characterized as a "statement of national opportunities," the document established a national health agenda for this decade. Driving this initiative was the understanding that lifestyle practices were the primary contributing factors to 8 of the 10 leading causes of death in the nation and that health promotion therefore must be a central component in the nation's health care strategy. The underlying values embodied by the *Healthy People 2000* agenda are that health is an essential building block of individual well-being and that all Americans deserve the opportunity to achieve and maintain a maximum level of functioning.

The states were challenged to adopt *Healthy People 2000* programs in which they would concentrate their public health efforts on those objectives among the more than 300 national health objectives that would move states closer to achievement of three overall goals:

1. Increase the span of healthy life for all Americans;
2. Reduce health disparities among Americans; and
3. Achieve access to preventive services for all Americans.

In response to this challenge, Governor Bruce Sundlun established a community-based task force in 1991, chaired by Dr Barbara DeBuono, director of the Department of Health, and charged with identifying priority health objectives for the state and subsequently developing and implementing a plan for achieving those objectives (see Appendix 1). To support the selection of priority objectives, the Department of Health conducted a baseline assessment of the health of Rhode Islanders, identifying the major causes of morbidity, mortality, and years of potential life lost.² These data provided the Task Force, and five issue-specific committees, the basis for: 1) selecting the health objectives that would have the greatest impact on the health of our

population and the greatest potential for being achieved within the decade; 2) setting realistic measurable targets for each objective, to be achieved by the year 2000; and 3) identifying the highest-risk population groups for each health objective.

This process resulted in the selection of 25 priority health objectives for Rhode Island. For each objective, the task force committees identified target population groups, major service settings, and strategic interventions. In addition, public and private agencies who might serve as collaborators were identified. Table 1 displays the 25 selected health objectives and the targets established for each objective.

In January 1994, Governor Sundlun formally adopted the Healthy Rhode Islanders 2000 plan and its 25 health objectives.³ The task force is now completing a plan to implement and monitor the Year 2000 objectives. The means proposed to achieve the objectives include the following strategies:

1. Health promotion programs focusing on individual lifestyle and behavior change;
2. Health protection programs identifying environmental and/or regulatory measures conferring protection on large population groups; and
3. Preventive services targeting access to primary care and clinical/screening services oriented toward prevention of disease.

It is our intention to broaden ownership of this public health agenda beyond the Department of Health and the Governor's Task Force through a three-pronged approach. First, a corporate challenge program has been designed to spawn a public-private partnership in which private industry and community agencies are challenged to sponsor worksite programs or broader population activities supporting *Healthy Rhode Islanders 2000* objectives. Second, community coalitions will be established or expanded to provide a voice for advocacy around specific objectives. Third, a media program and public education campaign will be initiated to promote a public health perspective, generate public awareness, and influence public policy.

Throughout the remainder of the decade, the department will monitor progress toward achieving each of the state health

objectives for the year 2000. A matrix has been developed identifying health status indicators that can be used to measure progress,¹ and an index combining these indicators into an overall gauge of achievement is under development. Each year, an assessment will be conducted of changes in health status for the population as a whole and for population subgroups. Progress will be reported through *Healthy Rhode Islanders 2000* publications, as well as through an annual conference.

Healthy Rhode Islanders 2000 presents a vision of a healthier future for all citizens of the state. The focus on health promotion and disease prevention adds a needed public health dimension to the vision of a reformed health care system which is currently being debated. A truly reformed health system must address more than questions of access to medical care and reimbursement for its delivery. Population-wide improvements in health status will depend as much on efforts to move individuals towards making healthy lifestyle choices as it will on availability of clinical services. *Healthy Rhode Islanders 2000* offers just such an opportunity.

(For a copy of *Healthy Rhode Islanders 2000*, which describes each objective in detail, or to be put on the mailing list, please contact Deborah Laufer at the Office of Health Policy and Planning, Rhode Island Department of Health, Three Capitol Hill, Room 408, Providence, RI 02908 or at (401) 277-2901.)

References

1. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. United States Department of Health and Human Services, Public Health Service. Washington, DC (1990).
2. *National Health Promotion and Disease Prevention Objectives: Baseline Assessment*. Rhode Island Department of Health, Office of Health Statistics. Providence, RI (1992).
3. *Healthy Rhode Islanders 2000*. Rhode Island Department of Health, Office of Health Planning. Providence, RI (1993).

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Table 1.—State Health Objectives for the Year 2000, Rhode Island.

INCREASE PHYSICAL ACTIVITY, by—

- increasing to 60% the proportion of people aged 6 and older who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day
- reducing to 15% the proportion of people aged 6 and older who engage in no leisure-time physical activity

INCREASE HEALTHY DIET, by—

- reducing dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of people aged 2 and older
- increasing complex carbohydrate and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables (including legumes) and fruits, and to 6 or more daily servings for grain products
- reducing the mean serum cholesterol concentration among adults to no more than 200 mg/dL

REDUCE TOBACCO EXPOSURE, by—

- reducing cigarette smoking to a prevalence of no more than 15% among people aged 20 and older
- reducing the initiation of smoking by children and youth so that no more than 15% have become regular cigarette smokers by age 20
- reducing smokeless tobacco use by males aged 12 to 24 to a prevalence of no more than 0.5%
- enacting and enforcing comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places

REDUCE ALCOHOL AND OTHER DRUG RELATED

HEALTH PROBLEMS, by—

- reducing drug-related deaths by 21% to no more than 4.6 per 100,000 people
- reducing deaths caused by alcohol-related motor vehicle crashes by at least 20% to 4.5 per 100,000 people

REDUCE THE PROPORTION OF PREGNANCIES THAT ARE UNINTENDED BY 30 PERCENT

REDUCE SUICIDES AND INJURIOUS SUICIDE ATTEMPTS, by—

- reducing suicides by 10% to no more than 9.2 per 100,000 people
- reducing by 15% the incidence of injurious suicide attempts leading to hospitalization to 84 hospitalizations/100,000

REDUCE THE PREVALENCE OF MENTAL DISORDERS, by—

- reducing the prevalence of mental disorders among children and adolescents to less than 10%
- reducing the prevalence of mental disorders (exclusive of substance abuse) among adults living in the community to less than 10.7%

REDUCE HOMICIDES AND ASSAULT INJURIES, by—

- reducing homicides by 15% to no more than 5.0 per 100,000 people
- reducing assault injuries leading to hospitalization by 10% to no more than 44/100,000

PROVIDE QUALITY SCHOOL HEALTH EDUCATION, by—

- increasing to 100% the proportion of elementary and secondary schools that provide planned and sequential kindergarten through 12th grade quality school health education

REDUCE UNINTENTIONAL INJURIES, by—

- reducing fatal unintentional injuries by 15% to no more than 22.5 per 100,000 people
- reducing nonfatal unintentional injuries by 15% so that hospitalizations for this condition are no more than 483 per 100,000 people

IDENTIFY, MANAGE, AND PREVENT WORK-RELATED

DISEASES AND INJURIES WITHIN THE STATE, by —

- reducing the five-year average work-related death rate by 25%

- reducing the five-year average work-related injury rate by 25%

- reducing the five-year average work-related illness rate by 25%

REDUCE CHILDREN'S BLOOD LEAD LEVELS, by—

- reducing the prevalence of blood lead levels exceeding 10 μ g/dL by 50% and exceeding 20 μ g/dL by 75% among children through age 5 years

REDUCE EXPOSURE TO ENVIRONMENTAL TOBACCO

SMOKE, by—

- reducing by 50% the number of children exposed to environmental tobacco smoke in enclosed spaces
- increasing to 50% the number of workplaces that are smoke free

REDUCE RISK TO HEALTH FROM RADON, by—

- reducing the number of occupied buildings that have radon levels greater than 20 pCi/L by 50%

REDUCE RISK TO HEALTH FROM DRINKING WATER, by—

- increasing to at least 85 percent the proportion of people who receive a supply of drinking water that meets the safe drinking water standards established by the Environmental Protection Agency

REDUCE INFECTIONS CAUSED BY FOODBORNE PATHOGENS

- and specifically reduce the incidence of infection by salmonella species to no more than 16 per 100,000 population

IMPROVE ORAL HEALTH, by—

- reducing dental caries (tooth decay) so that the proportion of children with one or more caries is no more than 35% among 6-8 year-olds and no more than 60% among 15 year-olds
- increasing to 85% the proportion of people who have had a preventive dental visit in the previous year
- increasing to 90% the proportion of people who are insured for routine, emergency, and restorative dental care
- reducing mortality from cancer of the oral cavity and pharynx to no more than 7 deaths per 100,000 people ages 45 through 74

REDUCE POOR BIRTH OUTCOMES, by—

- reducing infant mortality to 6.0 per 1,000 live births
- reducing low birthweight to an incidence of 5.0% of live births and very low birthweight to 1.0%
- reducing tobacco use by pregnant women to 10% and reducing alcohol and illicit substance use by pregnant women to 5%
- increasing the proportion of pregnant women who receive prenatal care in the first trimester to 90%

REDUCE HIGH BLOOD PRESSURE, by—

- increasing to at least 75% the proportion of people with high blood pressure whose blood pressure is under control

INCREASE SCREENING FOR BREAST AND CERVICAL

CANCERS, by—

- increasing to at least 90% the proportion of women aged 40 and older who have ever received a clinical breast examination and a mammogram, and to at least 80% those aged 50 and older who have received them within the preceding 1 to 2 years
- increasing to at least 95% the proportion of women aged 18 and older with uterine cervix who have ever received a Pap test, and to at least 95% those who received a Pap test within the preceding 1 to 3 years

LIMIT THE PREVALENCE OF HIV INFECTION

- to no more than 800 per 100,000 people from an estimated 400 per 100,000 people

REDUCE THE RISK TO THE PUBLIC FROM EXISTING AND

EMERGING COMMUNICABLE DISEASES, by—

- reducing the tuberculosis case rate in Rhode Island to 3.5

Table 1.—State Health Objectives for the Year 2000, Rhode Island (continued).

cases per 100,000 population per year
 increasing public awareness and education on rabies which
 will be measured by increasing the percentage of dogs and
 cats vaccinated against rabies to 80%
 decreasing the case rate for Lyme disease to 20 cases per
 100,000 population per year
INCREASE CHILDHOOD IMMUNIZATION LEVELS, by—
 increasing basic Immunization series among children under
 age 2 to at least 90%
INCREASE ACCESS TO PRIMARY CARE, by—
 increasing to at least 95% the proportion of people who
 have a specific source of ongoing primary care for coordina-
 tion of their preventive and episodic health care
 improving financing and delivery of clinical preventive

services so that virtually no Rhode Islander has a financial
 barrier to receiving, at a minimum, the screening, counsel-
 ing and immunization services recommended by the US
 Preventive Services Task Force
**REDUCE LIMITATIONS AS A RESULT OF CHRONIC
 CONDITIONS AND DISABILITIES**, by—
 reducing the proportion of people who experience a major
 activity limitation to less than 10%
 insuring access both in delivery of services and physical
 environment (compliance with the Americans with Disabili-
 ties Act) for people with chronic conditions or disabilities, so
 that they can readily utilize the prevention and intervention
 services outlined in the objectives in this document

Appendix 1.—Governor's Task Force for Year 2000 Health Objectives for Rhode Island

Chair: Barbara A. DeBuono, MD, MPH Director of Health Rhode Island Department of Health	Kathleen Hittner, MD Director Division of Anesthesiology Roger Williams Medical Center	Peter McWalters Commissioner Rhode Island Department of Education (Designee: Philip Zarlengo)
Steven Baron President Miriam Hospital	Rev. Willie R. James, Sr. Chairman The Gathering Shaw Memorial A.M.E. Zion Church	Rear Adm. Paul J. Mulloy, USN (Ret.) Director Department of Substance Abuse
F. Richard Burdett Executive Director Rhode Island Business Group on Health	Charles B. Kahn, MD President Rhode Island Medical Society	Vidal Perez, Executive Director Providence Ambulatory Health Care Foundation
David A. Chatel Executive Director American Heart Association	Margaret E. Kane Executive Director Rhode Island Lung Association	Georges Peter, MD Director Division of Pediatric Diseases Rhode Island Hospital
B. Jae Clanton Executive Director Urban League of Rhode Island	William Kreykes President Rhode Island Hospital	A. Kathryn Power, MEd, Director Rhode Island Department of Mental Health, Retardation, and Hospitals
Barbara Colt Executive Director Rhode Island Health Center Association	Richard LeClerc Executive Director Community Counseling Center of Pawtucket	Pablo Rodriguez, MD Medical Director Planned Parenthood of Rhode Island
Gail Costa Vice President for Planning Women and Infants Hospital	Armand Leco Executive Vice President Blue Cross/Blue Shield of Rhode Island	Anne Marie Silvia Executive Director Rhode Island Project AIDS
Steven M. Costantino Executive Director Drug and Alcohol Treatment Association	Jane A. MacKenzie, President Visiting Nurses Association of Rhode Island	Steven E. Slaughter Executive Vice-President RI Division, American Cancer Society
Edward daMota Executive Director Coalition for Consumer Justice	Maureen Maigret Director Rhode Island Department of Elderly Affairs	Max Powell III Chief Executive Officer United Health Plans of New England
Peter Dennehy, JD Principal Policy Analyst Governor's Policy Office	Patrick H. Mattingly, MD President Harvard Community Health Plan of New England	Judy Squires Co-President Rhode Island School Health Association
Robert J. Fallon, Esq. Director Rhode Island Department of Human Services	Edward J. McElroy President, AFL-CIO (Designee: Cynthia Lussier)	Harold Ward, PhD, JD Center for Environmental Studies Brown University



Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John Fulton, PhD, and Bela Matyas, MD

Raccoon Rabies Epizootic Reaches Rhode Island

Bela T. Matyas, MD, MPH, and Utpala Bandy, MD, MPH

Rhode Island reported its first case of confirmed mid-Atlantic strain rabies on January 25, 1994, when a raccoon was destroyed in the Nasonville section of Burrillville (Figure 1). Three weeks later the state's second rabid raccoon was destroyed on a busy street in Woonsocket, bringing the rabies epizootic (animal epidemic) into Rhode Island's urban neighborhoods. In the following 12 weeks, eight additional rabid animals, seven raccoons and a red fox, were destroyed in Rhode Island. The red fox represents a "spillover" from raccoons, the predominant carrier of the mid-Atlantic strain, to another mammalian species.

Background of the Mid-Atlantic Rabies Epizootic

The current epizootic began in Florida during the 1950s. It spread to the mid-Atlantic states in 1977 when the first case was documented in West Virginia. It is thought to have been introduced there by coon hunters who imported raccoons from Florida. The outbreak among raccoons progressed up and down the coast, and involved (in the order affected) West Virginia, Virginia, Maryland, Pennsylvania, District of Columbia, Delaware, New Jersey, New York, Connecticut, North Carolina, Ohio, New Hampshire, Massachusetts, and now Rhode Island.

In each of the affected states, the discovery of the first rabid raccoon was rapidly followed by an explosive rise in the number of infected raccoons detected, then an increase in the number of cases identified among other wild animal species, including skunks, foxes, and woodchucks, then an increase in the number of cases identified

among domestic animals. After several years of peak rabies activity a gradual decline in animals affected is generally observed as the wild reservoir becomes depleted, followed by a return to an endemic plateau. Connecticut is just beginning to observe this decline, while Massachusetts is still enmeshed in a period of rapid growth of infected animals.

Reports of animal sightings and human exposures to animals, including animal bites, increase 10-fold within several months of onset in a new area. Likewise, the burden on public health resources increases dramatically. Fortunately, no lives have yet been claimed by the mid-Atlantic strain. The death of a young girl in New York last year was caused by exposure to bat rabies.

Governor's Rabies Public Awareness And Prevention Campaign

Last fall, in anticipation of an imminent Rhode Island epizootic, the governor issued an executive order creating a rabies public awareness and prevention campaign, funded by \$100,000 of the governor's contingency funds. These funds have been used by the Department of Environmental Management to purchase supplies for its conservation officers and to produce public education materials, by the Rhode Island Emergency Management Agency to staff a toll-free rabies information hotline (1-800-482-7878), and by the Department of Health to purchase vaccine and to pay for laboratory costs and billboard publicity.

Aggressive educational efforts since last fall have targeted pediatricians, police departments, and the public. The number of reduced-cost animal rabies immunization clinics has been increased across the state. A school campaign is planned for the spring. Prophylactic vaccination of animal control officers and selected police officers has begun, starting with officers working in

Rhode Island border towns and cities.

Rabies Risks to Rhode Islanders

The first raccoon in Rhode Island identified as infected with the mid-Atlantic strain of rabies was found eating a cat alive. The second rabid raccoon was found walking on its hind legs down a busy city street at midday. Most rabid animals are not as easy to spot. Many have "dumb" rabies and exhibit either no symptoms or symptoms of lethargy and slowness. These rabid animals may in fact appear to be quite friendly and are attractive targets for young children. Fortunately, no human exposures have yet occurred in Rhode Island as a result of the current epizootic.

In the 1940s, dog rabies was endemic in Rhode Island. Dog rabies and associated human rabies have been all but eliminated in Rhode Island since the 1950s by removing stray dogs, vaccinating pets, and administering vaccine to exposed persons.

Rhode Island has had an endemic level of bat rabies for many years. The latest rabid bat was found in April 1994. The raccoon epizootic is far more likely to result in human exposures, however, and will be harder to address than previous epizootics.

In the current raccoon epizootic, the reservoir is a population of wild animals that has considerable contact with humans. Raccoons coexist comfortably with humans, living off garbage. They are common in rural, suburban and urban neighborhoods and, unlike bats, often invite human contact because of their appealing appearance, especially for children. Raccoons share niches in whole or part with several wild animal

ABBREVIATIONS USED

CNS: Central nervous system
HDCV: Human diploid cell vaccine
RIG: Rabies immune globulin
RVA: Rabies vaccine absorbed

From the Division of Disease Control, Rhode Island Department of Health, Three Capitol Hill, Providence, RI 02908-5097; (401)277-2432.

For individuals not previously vaccinated:

Rabies immune globulin:
20 IU/kg of body weight (if anatomically feasible, up to half the dose should be infiltrated around the wound or wounds and the rest should be administered intramuscularly in the gluteal area. Never give more than the recommended dose. Do not use the syringe used for vaccine or inject into the same anatomical site.)

For individuals previously vaccinated:^c

Rabies immune globulin:
Should not be given.

Vaccine:
1.0 ml of HDCV or RVA intra-
muscularly in the deltoid area^b on
days 0 and 3.

^b The deltoid area is the preferred site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.

^cPrevious vaccination with HDCV, RVA, or any other type of rabies vaccine, and a documented history of antibody response.

Considering the experiences of neighboring states, Rhode Island will likely experience a very rapid spread of the raccoon epizootic, including rapid intrusion into urban areas and rapid spillover to other mammalian species. Nearly all Rhode Island communities will likely be affected by summer, and cats and other domestic ani-

Clinical Aspects of Rabies

The clinical presentation of human rabies includes an asymptomatic incubation period of 14 to 60 days (rarely, as long as 6 months), followed by an acute neurologic phase with disorientation, hallucinations, hydrophobia, hypersalivation, arrhythmias, and eventual coma and death, from 2 to 2 days after onset. The infectious period begins 1 week before onset and peaks 1 to 3 weeks post onset. Saliva and respiratory secretions are potentially infectious, though person-to-person transmission has not been documented except following corneal transplant.

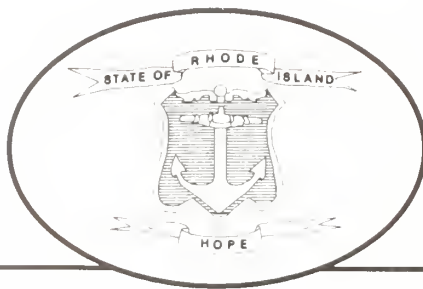
The clinical care of a person who may have been exposed to rabies requires first assessing whether a significant bite or non-bite exposure has occurred, and then assessing the likelihood that the animal involved was rabid. To this end, it is vitally important to capture the involved animal for quarantine or euthanasia after an incident. Consultation with local animal control officers and the Department of Health is strongly recommended to determine appropriate procedures. Secondary prevention consists of destroying the rabies virus before it reaches the CNS.

Diploid Cell Vaccine or Rabies Vaccine Absorbed), as outlined in Table 1. The cost of RIG is about \$250-300 depending on the size of the individual, and the cost of vaccine is at least \$100 per injection. The total cost of post-exposure prophylaxis, therefore, is \$750-800 per individual. Post-exposure prophylaxis is not without risk of side effects and allergic reactions. Therefore, we strongly urge that all human exposures or suspected human exposures to rabid animals be reported to the Rhode Island Department of Health. The number for reports during working hours (Monday through Friday, 8:30-4:30) is 401-277-2577. Reports after working hours, on weekends, and on holidays should be made to the physician on-call at 272-5952.

Primary prevention of rabies consists of changing people's behaviors to minimize contact with potentially rabid animals.

All cats, dogs, and pet ferrets should be vaccinated, as required by state law. Contact with wild animals and with stray dogs and cats must be avoided; unless the vaccination status of an animal is known for sure, it should be treated as potentially rabid. Pet food must not be left outdoors, as this attracts wild animals and strays. Outdoor garbage must be contained to prevent intrusion by wild or stray animals; garbage should be placed outside in secured containers just before collection.





Patterns of Adolescent Substance Abuse, 1993

The abuse of addictive substances by adolescents is a major national health issue. Eight of the nation's Year 2000 Health Objectives address the prevalence of substance use among young people 12 to 24 years old.¹

To support state and local substance abuse prevention programs, the RI Department of Health has conducted an Adolescent Substance Abuse Survey (ASAS) biennially since the 1988-89 school year. The third ASAS was conducted in April and May of 1993, and assessed the use of tobacco, alcohol, marijuana, and other abused substances among Rhode Island's secondary school students.

The 1993 survey involved 75 junior and senior high schools in 29 of the state's 35 school districts. A total of 40,351 students in grades 7 through 12 responded to the survey, for an overall participation rate of 79%. Student participation was voluntary and anonymous. Questions included students' demographic characteristics; their use of tobacco, alcohol, and other substances; and items expected to be useful in explaining or predicting substance abuse patterns.

The 1993 ASAS revealed, as did previous surveys, high levels of substance use by Rhode Island adolescents.² Alcohol in particular is a widespread problem, used by more students in all grade levels than any other substance. In the past month, 30% of 7th graders and 61% of high school seniors drank an alcoholic beverage. In addition, heavy drinking is common—9% of 7th graders and 36% of seniors reported getting drunk at least once in the past month (Figure 1).

Use rates for tobacco products, both cigarettes and smokeless tobacco, are lower than national averages but above the Healthy People 2000 target rates. Nine percent of 7th graders and 25% of seniors reported smoking cigarettes in the past week, and 6%

of all boys reported using smokeless tobacco sometimes or daily (Figure 2).

Other than alcohol and cigarettes, marijuana is the most frequently used substance across all grades. Almost 7% of 7th graders and 22% of seniors reported using marijuana in the past month.

Initial use of alcohol, cigarettes, or marijuana in grade 6 or earlier is reported by students from all grades but by a larger percentage of students in grades 7 and 8 than by students in higher grades. Twelve percent of 7th graders and 5.4% of seniors report having used alcohol without parents present in grade 6 or earlier (Figure 3).

The 1993 ASAS documents these substance abuse patterns among Rhode Island adolescents—early initiation of use, broad penetration in the high school population, and involvement of a wide variety of substances. Substance abuse prevention policy and programs, at both the state and local levels, must reflect this complexity. In two

specific examples of broad-based prevention efforts, the state's Departments of Health, Education, and Substance Abuse recently joined forces to decrease risky behaviors among adolescents, including the use of cigarettes, alcohol, and drugs. These initiatives are the establishment of school-based family centers and community-based school health centers. These and other such programs represent critical opportunities to reduce exposure to harmful substances among this vulnerable population.

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2. Office of Health Statistics. *The 1993 Rhode Island Adolescent Substance Abuse Survey: Report of State-wide Results*. Providence, RI: Rhode Island Department of Health, March 1994. (Available on request to the Office of Health Statistics.)

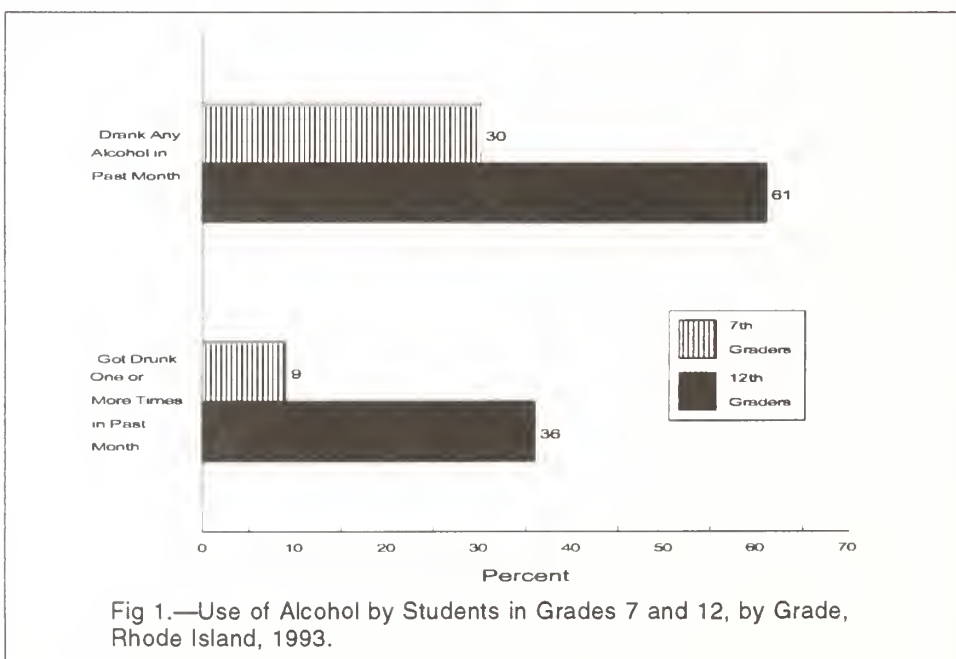


Fig 1.—Use of Alcohol by Students in Grades 7 and 12, by Grade, Rhode Island, 1993.

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Description: Yohimbine is a 3a-15a-20B-17a-hydroxy Yohimbine-16a-carboxylic acid methyl ester. The alkaloid is found in Rubaceae and related trees. Also in Rauwolfia Serpentina (L) Benth. Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine. It is a crystalline powder, odorless. Each compressed tablet contains (1/12 gr.) 5.4 mg of Yohimbine Hydrochloride.

Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalamic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it, however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

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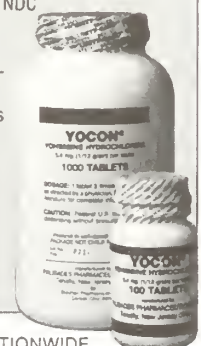
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.^{1,3,4} 1 tablet (5.4 mg) 3 times a day to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.³

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References:

1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed. p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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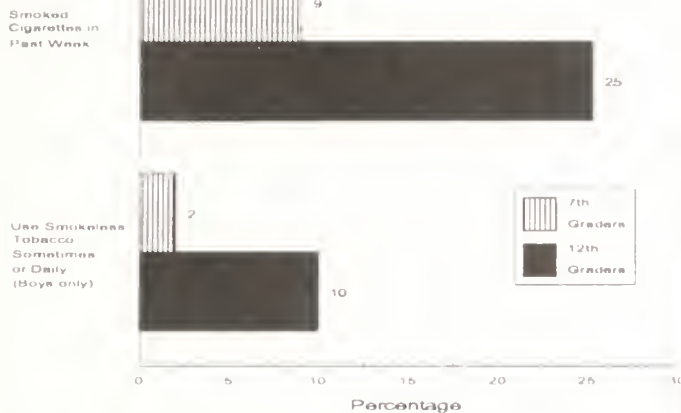


Fig 2.—Cigarette Smoking and Use of Smokeless Tobacco by Students in Grades 7 and 12, by Grade, Rhode Island, 1993.

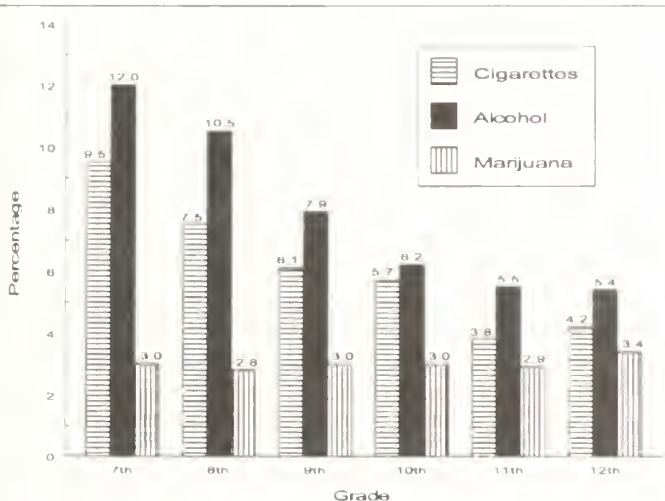


Fig 3.—Initial Use of Cigarettes, Alcohol, and Marijuana before Seventh Grade by Students in Grades 7 through 12, by Grade, Rhode Island, 1993.

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THE RHODE ISLAND MEDICAL JOURNAL

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Issued Monthly under the direction of the Publication Committee

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NUMBER 1

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago June 1904

H.G. Partridge, MD, of Providence reports on a case of toxemia of pregnancy. At the onset, he notes: "Someone has said that pregnancy is a 9 months' illness, and while we may consider this to be a somewhat exaggerated statement, we must admit that pregnancy brings about a mighty change in the maternal organism, and renders the woman unusually susceptible to disease, and also brings about the danger of certain diseases occurring only during this condition." The reported case is that of a 27-year-old healthy primiparous woman, 7 months pregnant. Two weeks later some ankle edema appeared and albumen was noted in her urine. During the next few weeks the urinary albumen increased alarmingly, accompanied by lassitude and anasarca. The patient was then placed on a strictly non-nitrogenous diet (fruit, bread, water), and hot baths, as well as nightly Extract of Colocynthis [a powerful alkaloid purgative derived from the dried pulp of the fruit of the Asiatic tree *Citrullus colocynthis*—Ed.] "... to induce watery stools." Symptoms improved rapidly, and the patient entered labor about 6 weeks later. The newborn (5 $\frac{1}{2}$ lbs) was in "asphyxia pallida" requiring extensive resuscitation. During the postpartum interval, the mother developed a moderate anemia following the expulsion of a large intrauterine blood clot. The anemia was treated with Bland's compound (ie, ferrous carbonate) and arsenious acid. The urine cleared and a month later both mother and child were described as "perfectly healthy." The author emphasizes the insidious nature of toxemia and the small size of this newborn due to "the evil effects of toxemia." And, he stresses the essentiality of periodic urinalysis in the care of the pregnant woman. [No mention is made of any blood pressure determination,

or of any seizure disorder during this pregnancy.—Ed.]

The minutes of the quarterly meeting of the Rhode Island Medical Society are published. The current membership stands at 303 (275 of whom are resident members), a gain of 10 over the previous year. Three members have died during the preceding year. The treasurer reported a balance of \$621.62. The transcription of Dr Walter E. Fernald's remarks are included. Fernald, superintendent of the Massachusetts School for the Feeble Minded in Waltham, Mass, discusses some of the problems encountered in Rhode Island. He states: "For many years we have received pupils from Rhode Island, and we feel compelled to charge them double what we ask pupils from Mass. The applications from Rhode Island are steadily increasing, averaging of late, two or three a week. The Institution (at Waltham) is for the more pronounced mentally defective. Many of these are in an amoral condition, defective in the sense of mine and thine, and especially lacking in sexual control." Fernald then describes the bitter

problems of large numbers of illegitimate pregnancies, mental impoverishment and delinquent behavior.

50 Years Ago (June 1944)

The lead article represents the text of the third annual Charles V. Chapin Oration, this year given by Reginald Fitz, MD, and entitled, Forecast by Numbers. The paper represents an exploration of the quantitative components of medical delivery, particularly the distribution of physicians and the increasing use of hospitals. The author uses records from Rhode Island and Massachusetts as the basis for his observations and conclusions. He notes, first, that the growth in the number of registered physicians has essentially paralleled the growth in general population since 1870. The use of hospitals, during this same interval of about half a century, however, has far exceeded the population growth. His analyses of Rhode Island are extrapolated from data derived from the three largest hospitals

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in the state. He points, next, to the relative paucity of house staff in Rhode Island, when compared to hospitals of similar size in Boston. The number of specialists in Rhode Island is next discussed. He lists only 76 board-accredited diplomates, younger than 65 years, in Rhode Island. The author also comments on the occasional talk of a medical school at Brown University. He ends with a plea that American medicine reconstruct itself in the years following the end of the current world war, creating, among other resources, new educational opportunities particularly for those physicians returning from military service.

Michael Sullivan, MD, president of the Rhode Island Medical Society discusses changing aspects of medical organization in relation to an expanding industrial base in the state and the necessary assistance needed for the various war agencies.

An editorial notes the vast improvement in the effectiveness of battlefield medicine: 97 of every 100 wounded are now saved, in contrast to the dismal record of prior conflicts. Other commentaries mention the vastly increased numbers of women entering the work force and the need, therefore, for specialized medical care for them. Syphilis in industrial work-forces is also mentioned and, in a recent survey, is found in 3.3% of those serologically tested. News is offered regarding Rhode Island physicians serving in the military (promotions, reassignments.)

25 Years Ago (June 1969)

John J. Cunningham, MD, president of the Rhode Island Medical Society, presents his presidential address on post-graduate medical education and community organization in the delivery of quality medical care in Rhode Island. The author first reviews the events of the prior year, suggesting in passing, that there is now much room for cooperation with osteopathic physicians (eg, joint licensure procedures). He advocates, too, the need for hospital-based programs allowing physicians to undergo intensive professional re-education. Mention is also made of the need for a local medical school at Brown. He acknowledges progress but observes, "How long will it take to get this program going?"

Ernest J. Quesnel, MD, and Alan Willoughby, PhD, present a paper representing their experience in the acute management of over 400 cases of delirium tremens, including the use of newer agents such as chlorpromazine.

S.J.P. Turco, MD, and A.A. Savastano, MD, discuss diets in athletics, stressing that

food fads cannot replace a balanced diet for athletic performance. The history (and claims) of Gatorade are carefully reviewed.

The new officers of the Rhode Island Medical Society for 1970 are listed (Richard P. Sexton, MD, Charles S. Dotterer, MD, Stephen J. Hoyer, MD, John P. Grady, MD, Edmund T. Hackman, MD and Seebert J. Goldowsky, MD.

A report of the Maternal Health Committee notes two obstetrical deaths (one direct, one indirect) during the past year (among 15,676 deliveries). This translates to a maternal mortality rate of 0.64 per 10,000 live births. In 1931 the rate was 76.0 per 10,000 live births. The nationwide maternal mortality rate (1967, the latest figure available) was 2.89 per 10,000 live births.

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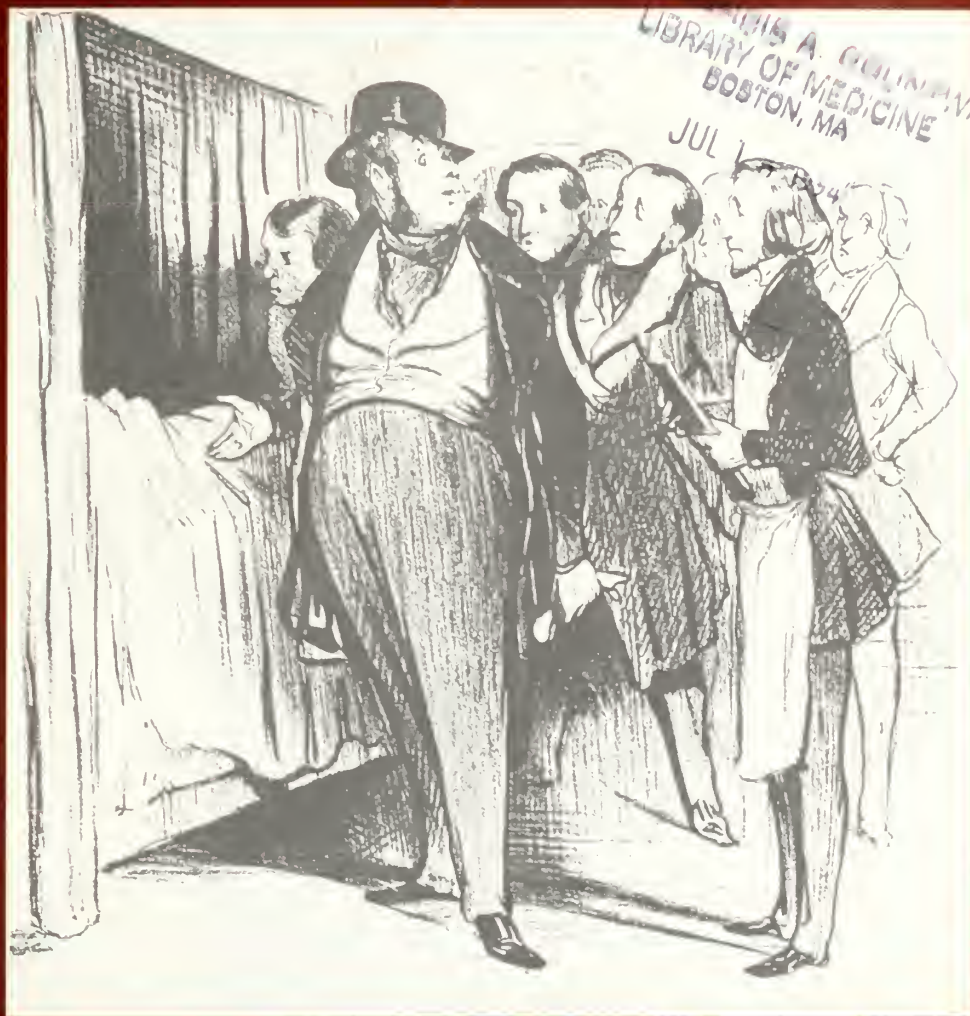
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The Rhode Island Medical Society wishes to acknowledge, with gratitude, the support given by the American College of Physicians for this issue of RHODE ISLAND MEDICINE.

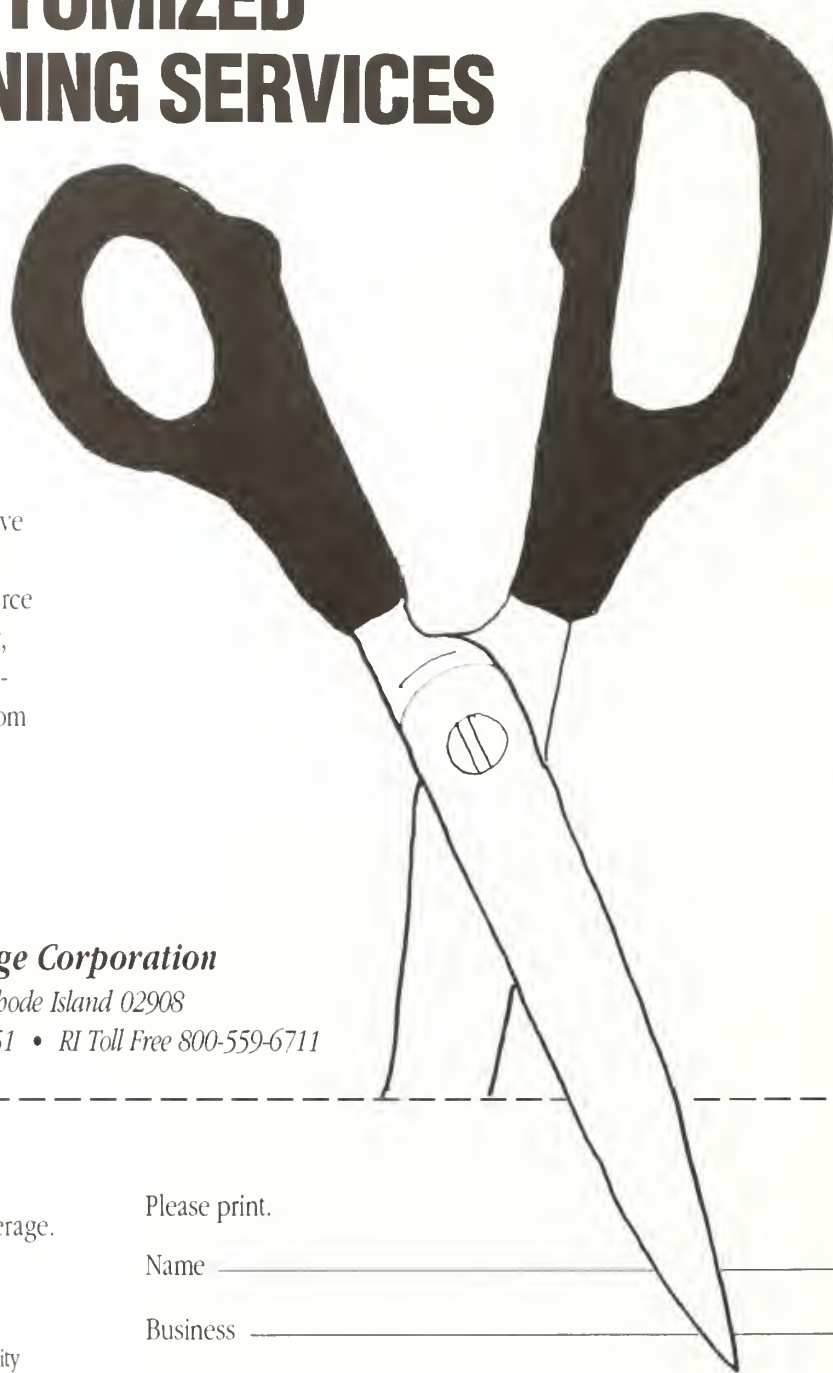
Cover: H. Daumier's artistic conception of medical teaching rounds in the mid-19th century.

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Ruth B. Sauber

Medical school deans come and go; course leaders and the courses they teach are recast from year to year; and medical students rarely linger for more than 4 years. Change, then, is one of the few inescapable certainties in the life of this—or any—medical school. And yet, with all the incessant movement at Brown's medical school, a few constancies could still be found. Preeminent among these certainties has been Ruth B. Sauber, who has served brilliantly and faithfully as Brown's Medical Student Affairs Officer since the dawn of the school in 1972.



For 23 uninterrupted years Ruth has labored with successive classes of medical students, becoming the longest serving medical school administrator and the only officer to have worked with every Brown medical student since this school's inception. In these 23 eventful years, Ruth has personally aided, counseled, advised and sometimes nurtured each of our approximately 1500 medical students. For an entire cohort of medical students in Rhode Island, Ruth's ministering has made the transition to physician-hood somewhat less agonizing, somewhat more resolute.

This month will witness Ruth's retirement from active labors with the medical school. On behalf of a generation of thankful medical students, many of whom are now in active practice locally, RHODE ISLAND MEDICINE expresses its deep gratitude to Ruth for her unique service to the profession of medicine. We wish her quiet joy in her enduring accomplishments, equanimity and many decades of good health.

Stanley M. Aronson, MD

Foolish Talk

The language of diagnostic medicine drifts inevitably into everyday street discourse. This diffusion is particularly evident with psychiatric terms—words such as idiot, imbecile, moron, stupid, insane—which once carried explicit meanings but have gradually been corrupted, thus entering a pool of indiscriminate words of scorn. The word idiocy for example, if uttered 9 decades ago, would probably have referred to the cognitive state of a mentally retarded child; today, more likely, the word is used to describe health care bureaucracy or the highway driving habits of Rhode Islanders. The technical words of yesterday have become the indiscriminate jargon of today. And with this loss of precision they have degenerated to an assortment of interchangeable invectives.

If one wishes to question anyone's sanity, reason or wit, our language now offers an astonishing menu of synonyms for mental enfeeblement.

Cretin: A word with a progression of meanings. Its origins are traced to Valais, a mountainous Swiss canton. In the local Alpine patois, *chretien* first signified a Christian; then, any human as distinguished from the beasts; then, in time, it was applied selectively to the poor and wretched to indicate that they, too, were creatures of God; and finally by the 17th century, since goitrous idiocy was endemic to this region, the term narrowed its definition to embrace only those congenitally hypothyroid individuals who were thereby rendered mentally deficient and dwarfed.

Dimwit: Dim, from an Old English word (*dimme*) meaning dark or unknown, ligated to another Old English word (*witen*) meaning to know. This older word *witen* (or its older Germanic form, *wizzan*) comes down to us in such current words as witness, wizard, witan and wisdom.

Dolt: An Old English word meaning

dull, unimaginative, stupid.

Dope: An old German word, *dopen*, meaning to dip or to baptize. Also, it came to mean solutions of substances including those containing opium (cf. dope addicts), and belatedly, one who is dimwitted, befogged or stupid.

Dunce: A 13th century word specifically coined as an insult. The followers of the Scottish theologian John Duns (Duns Scotus) were named *dunes* by the adherents of Thomas Aquinas who scorned their scholastic, hairsplitting sophistry. Over the centuries, the word (derived originally from Duns, a Berwickshire village) was modified to dunce.

Dummy: (Also, dumbbell, dumbhead, dumcake.) Dummy, now a diminutive, came originally from an Old High German word, *tumb*, meaning dull, stupid or incapable of words. It preserves this latter meaning in phrases such as "struck dumb," "deaf and dumb" or "dumb animals." Dumcakes, on the other hand, were pastries, required to be made in utter silence, by young maidens on the eve of St. Mark's (April 24) to foretell the identity of their future husbands. A dumbbell was originally a horizontal bar with weights on either end, anchored to church bells and pulled from below by attached ropes. By themselves, they produced no sound (ie, they were dumb).

Fool: From the Latin, *follem*, a bellows or bag. By analogy, it came to mean an empty head (see also, bubble-head, air-head). Often, it was a word blending pity with endearment (a lovable fool). "Let us be thankful for fools," said Mark Twain, "But for them the rest of us could not succeed." Sometimes, too, the word fool suggested deception.

Idiot: From the Greek, *idios*, meaning private, unique, or personal. Originally, then, it described a person not part of the establishment, unschooled, a layman (as opposed to a clergyman). The term evolved gradually to define those who were mentally deficient (amentia) and incapable of ordinary acts of reason, ie, witless. Idiocy, in the 19th century, meant mental retardation from birth (as in diagnoses such as amaurotic idiocy or Mongolian idiocy) in contrast to diminished intellectual capacity with onset later in life (and then called dementia). The original Greek sense of the root is preserved in current words such as idiosyncrasy and idiopathic.

Ignoramus: From the Latin root, *ignorare*, not to know (and earlier from the Greek, *gnosis*, as in the word, agnostic). Originally a neutral word connoting a lack of knowledge. The Latin word *ignoramus* (meaning, we do not know) was regularly employed by 17th century English Grand

Juries to deny indictment when, in their judgment, inadequate evidence had been presented by the prosecutor. They then wrote "*ignoramus*" upon the bill of indictment. By the next century, the word was used to describe unschooled lawyers and by extension, it became a generalized term of derision.

Imbecile: From the Latin, *imbecillus*, meaning weak or feeble; derived from an earlier Latin word, *umbacillos*, which meant without a staff (ie, weak, infirm). The root meaning staff (*bacillus*) is the origin of such current words as bacillus and baguette (ie, rod-like structures).

Moron: From the Greek, *moros*, meaning dull or sluggish. In 1910, an English alienist created the word to describe those children capable of achieving no more than the mental capacity of an 8 to 12-year-old. (Alienist, an obsolete term for psychiatrist, is derived from the Latin, *alienatus*, meaning estranged.) Thus, the moron became the diagnostic category for the least retarded of the mentally deficient population; the imbecile was defined as being somewhat more mentally enfeebled; and the idiot the most retarded. Indeed, by 1920, these three terms (moron, imbecile, idiot) were thought to possess numeric weight by the simple act of assigning intelligence quotient (IQ) limits to each of them. A new specialty has recently been established called morology, the study of fools and foolishness. Given the nature, ancient roots and magnitude of the subject, it is an utter wonderment that this science was only recently begun.

Numskull: Originally, Numb-skull. The Old English word, *nume*, meaning something taken away or seized, and the Old

German word *skala*, defining a drinking cup, and later, a skull (a likely early source for drinking vessels).

Silly: A word derived directly from Old English meaning helpless, simple, deserving of pity. Later it came to mean meager, unlearned, weak, foolish. But akin also to the German, *selig*, meaning blissful or happy, which comes closer to its current usage.

Simpleton: From the Latin, *simplicis*, meaning single, without guile, unpretentious. Over the centuries, the word came to mean innocent, free of duplicity; then, undistinguished and humble (eg, simple folk); then, with further evolution, unadorned, homely (as in plain and simple); and now, as in the word simpleton, one with deficiency of intellect. Simpletons, for reasons unclear, are revered in certain cultures as being divinely inspired. In the sciences, simple stands as the antonym of compound, thus preserving its earlier meaning.

Stupid: From the Latin, *stupere*, to be benumbed. The meaning broadened somewhat to suggest a dullness of faculties, to be stunned. Shakespeare says: "Is not your father grown incapable of reasonable affairs? Is he not stupid with age and altering rheum?" Currently the word means dull, apathetic, insensible and sometimes, inarticulate. The word stupor, when used by neurologists, defines a specific level of compromised consciousness. And the word stupendous harkens back to the earlier sense of being stunned to speechlessness.

It is probably wise to use these words sparingly and with deliberate caution. Suffer fools gladly, for they may indeed at times be correct. Ambrose Bierce, when attempting to define the fool, observed: "He

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it was who invented letters, printing, the railroad, the steamboat, the telegraph, the platitude, and the circle of the sciences. He created patriotism and taught the nations war—founded theology, philosophy, law, medicine and Chicago. In the morning of time he sang on primitive hills, and in the noonday of existence headed the procession of beings. And after the rest of us shall have retired for the night of eternal oblivion he will sit up to write a history of human civilization.”

Stanley M. Aronson, MD

Arsenic and Old Myths

Metals are not customarily considered as important sources for pharmaceutical agents; perhaps, if pressed, iron and copper salts come to mind, and maybe even a few compounds of gold and silver. But, in truth, medicine over the centuries had also identified a wealth of classical therapies derived from the lesser metals such as barium, mercury, antimony and arsenic. These metallic compounds, so important in the age of Paracelsus, had their therapeutic roots in the art of alchemy. More than the mere transmutation of base metals to gold, alchemy represented a primitive attempt to uncover the hidden “spirits” incorporated within these metallic substances—the forces capable of sustaining health and vigor. The closer that the attributes of these base compounds approximated gold, alchemists declared, the greater became their curative powers. The ultimate goal (and hence the importance of the conversion to gold) was to create an elixir of soluble gold (*aurum potabile*) capable of curing, amongst other infirmities, old age.

By the 15th century, arsenic, though widely recognized as a poison, was nonetheless acclaimed as one of the great curative gifts to humanity. William Withering, discoverer of digitalis, and a fervent defender of arsenical therapies, declared: “Poisons in small doses are the best medicines; and the best medicines in too large doses are poisonous.”

Arsenic is found in nature largely as complex sulfides, brightly yellow in color, and often intimately mixed with other metals such as silver, lead and antimony. Theophrastus is said to have given it its name, *arsenikon*, meaning a gold-hued substance. In Latin, this translated as *aurum pigmentum*, which, corrupted through the centuries, provided English with yet another name for arsenic, namely orpiment. Arsenic is rarely found in its pure elemental state. More commonly arsenicals exist as highly

toxic, chemically unstable sulfides, oxides—such as arsenic pentoxide (As_2O_5) and arsenic trioxide (As_2O_3)—or as arsenates of sodium, potassium or calcium.

Arsenic has many commercial applications and world production (usually as the trioxide) is about 60,000 tons annually. The bulk of it is employed as a wood preservative, but it also forms many alloys, insecticides, herbicides, fungicides, algicides, and rodent poison (eg, ratbane); it is used in the tanning process as a skin depilatory agent, as a pigment in the dyeing of interior fabrics and wallpapers; and, diminishingly, in some pharmaceutical products. Arsenic is a fairly common mineral. Unicellular algae, crustaceans and fish selectively accumulate arsenicals via the food chain, and marine fish commonly incorporate as much as 100 mg per kilogram of wet tissue. Bioaccumulated arsenic compounds, however, are usually found as organic arsenicals, such as arsenocholine, and are more stable and less toxic than the inorganic salts. The complex organic derivatives of arsenic acid are collectively called the cacodylic acids (from the Greek, *caco*, meaning bad or poisonous) and are distinguished by their unpleasant, garlic-like odor.

Arsenical intoxication in man (usually appearing after doses as small as 7mg per day) consists of nausea, vomiting, colic,

intense diarrhea, dehydration, shock, cyanosis, dementia, and cardiac failure. Some of the signs of chronic toxicity include brittle finger nails, peripheral sensory neuropathy, diffuse skin exfoliation, ataxia, loss of hair, hyperkeratosis of palms and soles, and later, multiple squamous cell carcinomata of the skin. Tolerant to the intake of arsenic occurs and arsenic-eaters are said to ingest lethal amounts without apparent distress. Mineral-rich, mountainous Styria, in southeast Austria, was famed for its alleged arsenic-eaters who claimed to be capable of great strength and endurance.

Standard pharmacology texts of the 1880s extolled the curative merits of arsenic. As an externally applied paste (admixed with cinnabar and emollients), it could destroy cancers of the skin or breast. As an internal agent, usually in the form of arsenious acid, it lowered blood pressure, was an astringent for gastric ulcers, acted as a tonic for the anorectic, cured heart burn, was a powerful antiperiodic (similar to quinine) in the treatment of various agues, headaches, and chronic rheumatism. Brunton's textbook (1880) states that “its effects are almost magical.” Further claims included the successful therapies for angina pectoris, epilepsy, asthma, and particularly, early tuberculosis. No known medication was said to cure or contain such a wide

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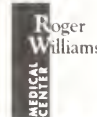
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variety of ills. Truly, the life-prolonging elixir called the philosopher's stone, the dedicated search for which had consumed the energies of alchemists, seemed to have been finally identified.

By 1911, standard medical texts were a little less sanguine about the medical uses of arsenic, but praise was nevertheless heaped upon such fluids as Fowler's Solution (*liquor arsenicalis*) which, in daily doses of 1/15 to 1/60 grain (ie, 1 to 4mg) were claimed to improve general metabolism, increase the flow of gastric juices, increase oxygen uptake by the tissues and, in anemias, increase the red blood cell count and hemoglobin concentration. It was also recommended for chorea, Hodgkin's disease, pernicious anemia, asthma, psoriasis, pemphigus and eczema. The year 1910 also witnessed Ehrlich's discovery of an organic arsenical (salvarsan) that cured syphilis and trypanosomiasis, thus providing even greater credence to the belief that arsenic, in a spectrum of compounds, was a miraculous substance.

During the last four decades of this century, however, the fame of arsenic, as medicine, had plummeted. The indexes of medical therapy texts provide a crude barometer of this fall from grace. In such standard sources as The Merck Manual or Physicians Desk Reference, arsenic is now mentioned solely in terms of measures to be undertaken to counteract its poisonous effects. Credulity has been replaced by scientifically based skepticism.

Yet another measure of arsenic's change in status can be seen in Goodman & Gilman's textbook, The Pharmacological Basis of Therapeutics. In the 1940 edition, arsenic is called a protoplasmic poison but with some limited medical uses. As an inorganic salt, Fowler's Solution (1 gm As_2O_3 100cc of a weak $KHCO_3$ solution) may be prescribed in secondary anemias ("...doubtful whether the drug is beneficial.") and for lowering of white blood cells counts, particularly in chronic myelogenous leukemia. It may also be given in psoriasis ("with fair results.") Organic arsenicals, on the other hand, elicit a greater enthusiasm, especially neoarsphenamine for the treatment of syphilis and carbarsone (a pentavalent arsenical) for amebiasis. Four editions later, the 1970 text states: "The only noteworthy present-day uses of arsenicals in human medicine include treatment of trypanosomiasis and amebiasis." When specific details are provided, however, melaronyl gives "disappointing results" in the treatment of trypanosomiasis, while glyciobiarsol is not "particularly effective" in amebiasis.

How does one reconcile arsenic's glowing endorsements before 1940—albeit diminishing—and its subsequent demotion to the category of absolute poison? Had medicine been practicing some monumental form of self-deception—or had they, perhaps negligently, discarded an agent of considerable value? On the other hand, might the miraculous cures of malaria, tuberculosis and epilepsy, ascribed to arsenic, represent some happy conjunction of a harmless, homeopathic dosage with the placebo effect? Or, might reliable observers such as Benjamin Rush have just been burdened with selective memories, remembering only the spontaneous cures?

From its grand therapeutic station in the

19th century arsenic has slowly faded away. The magic is gone and a collective embarrassment hides arsenic's quiet departure from the clinical scene. Of course, many therapies have in time been rejected but few—beyond the mercurials, blood-letting and arsenic—had been first proclaimed as near panaceas before their downfall. The value, indeed, the requirement, of dispassionate, randomized clinical trials, ethically conducted and rigorously supervised, now becomes more essential than ever when new and therapeutically promising agents arrive. The roster of false cures, from arsenic to krebiozin, should not be lengthened.

Stanley M. Aronson, MD

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The Future of Medical Education in Rhode Island

Stephen R. Smith, MD, MPH
Richard Weil, III, MD
Donald J. Marsh, MD

Medical practice is rapidly changing. Traditional fee-for-service reimbursement is fading as managed care plans use capitation and discounted fee schedules become the preferred methods of paying physicians. Ambulatory care settings grow in importance as hospital stays are shortened or avoided altogether.

These and other changes will also affect medical education. This article describes the changes likely to occur in undergraduate medical and graduate medical education in Rhode Island during the remainder of this decade.

Undergraduate Medical Education

The bookshelves of medical educators overflow with reports calling for reform in medical education. When interviewed, many deans report that their medical school is in the midst of intensive reform, yet little seems to change. This phenomenon has been called "reform without change" by Samuel Bloom.¹ He attributes this cosmetic reform to an underlying power structure within medical schools that benefits from the current arrangements and is inimical to real change.

Courses are shuffled around, rearranged, and relabeled, but the basic problems remain—an overloaded curriculum, overreliance on passive learning, overemphasis on memorization, too much time spent in tertiary care hospitals, inadequate direct supervision in clinical settings, and underrepresentation of important areas such as ethics, economics, primary care, geriatrics, sexuality, alcohol and addiction, rehabilitation, nutrition, public health, and preventive medicine.

The Brown University School of Medicine has approached curriculum reform from

a different angle than other medical schools. Our approach begins at the end and works backwards. The faculty first described the successful graduate in terms of the knowledge, skills, abilities, and personal values needed for a successful career medicine. Nine abilities were defined through this process (see Table 1). For each ability the faculty elaborated a set of observable behavioral criteria as a means of judging whether students were competent in that ability. The faculty further specified different ex-

Table 1.—Brown's 9 Abilities

Effective Communication
Basic Clinical Skills
Using Basic Science in the Practice of Medicine
Diagnosis, Management, and Prevention
Lifelong Learning
Self-Awareness, Self-Care, and Personal Growth
The Social and Community Contexts of Health Care
Moral Reasoning and Ethical Judgment
Problem Solving

pectations for performance by beginning, intermediate, and advanced students.

Nine working groups of faculty and students produced a knowledge base that defined a core content for the curriculum. Faculty selected content from this knowledge base to create assessment exercises for students. These assessment exercises require students to perform a task, completion of which demonstrates their mastery of an ability and related content.

An example of such a performance-based assessment in a basic science course occurs in anatomy. Each student must prepare and deliver an oral recitation on the region of the body under study. The student must construct the recitation around a clinical scenario that illustrates functional anatomy. For instance, a student might describe an inversion injury to the ankle, then point out the effect on various anatomical structures in the ankle and foot. The faculty can assess the student's performance in two of the nine abilities: effective communication and us-

... the Brown medical diploma will be a warranty on its graduates, certifying that each has met certain performance standards across a wide range of capabilities.

ing basic science in the practice of medicine. Of course, they also assess the student's understanding of anatomy.

Faculty also assess the abilities and knowledge base using performance-based assessment in the clinical clerkships. At the end of the clerkship in medicine, students participate in an Objective Structured Clinical Examination (OSCE), which consists of about a dozen 10-minute stations. At each station students must perform different tasks. At one station students may be required to listen to heart sounds and describe what they heard (usually a heart murmur). At another station students may be asked to obtain a focused history from a standardized patient complaining of difficulty in breathing. (A standardized patient is a person who has been trained to present a history or physical finding to students in reliable and consistent fashion.) Faculty observe the students doing these tasks and can judge their competence in several different abilities.

Together, the abilities and knowledge base represent a competency-based curriculum for the medical school. Beginning with the MD class of 2000, those entering school in 1996, all students will be required to demonstrate mastery of all the competencies before graduating. This curriculum initiative, dubbed *MD 2000*, not only specifies the outcomes of undergraduate medical education but also holds the medical school accountable in assuring that all of its graduates meet those expectations. In a sense, the Brown medical diploma will be a warranty on its graduates, certifying that each has met certain performance standards across a wide range of capabilities.

By their very nature, these competency requirements will require changes in the teaching and learning environment. Since the competency-based curriculum stresses the application of knowledge in tasks that the students will be doing as physicians, basic sciences and clinical medicine neces-

ABBREVIATIONS USED

GME: Graduate Medical Education
IME: Indirect medical education
OSCE: Objective Structured Clinical Examination

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sarily will be more closely integrated. The basic science faculty have recruited and welcomed clinical faculty into the classroom and laboratory to help place the basic sciences into a clinical context. Reciprocally, clinical faculty have reinforced the importance of basic science by bringing those concepts into the process of solving difficult clinical problems.

The training sites for students must shift to community-based ambulatory settings to provide opportunities for students to encounter much of the content described in the knowledge base. The communities themselves will serve as the locus for student learning, particularly as it relates to the social and community contexts of health care ability.

Performance-based assessment requires faculty to observe students in the performance of their tasks. This means that students must be actively engaged in their learning. The result is less lecturing and more student participation in a variety of learning activities such as problem-based learning, seminars, independent study, and laboratories.

Unlike attempts at reform in other medical schools, Brown's *MD 2000* initiative will not result in drastic changes in the structural components of the curriculum (ie, course titles, sequence, hours, and configuration). What will change substantially is the kind of teaching and learning activities taking place within the courses. As a result, the students will be better prepared to practice medicine in the 21st century.

Graduate Medical Education

Graduate medical education (GME) is likely to be profoundly influenced by two forces in health care reform: a price-sensitive system of competing health plans and a perceived need for more primary care physicians and fewer non-primary care specialists, or at least relatively fewer specialists.

Even without any major legislative changes, the current health care system is evolving toward consolidation of health providers into competing health plans. The vast majority of the population will be enrolled in managed care plans that will compete with each other largely on the basis of price, perhaps to the detriment of quality of care.

To keep their costs as low as possible, these managed care plans will admit their patients to the lowest cost hospitals. Since teaching hospitals are more expensive than non-teaching hospitals, managed care plans might be more likely to contract with the latter rather than the former. Whether they do or not depends upon changes in Medi-

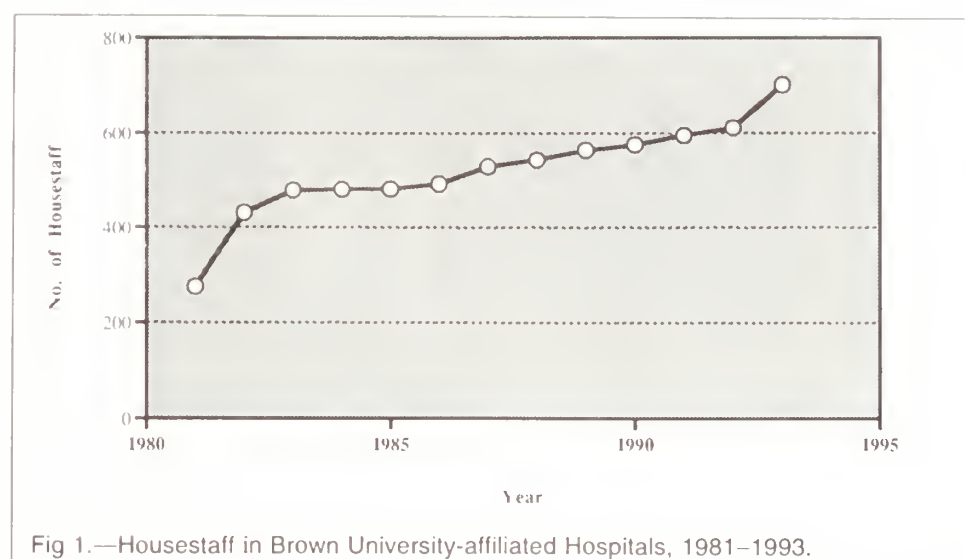


Fig 1.—Housestaff in Brown University-affiliated Hospitals, 1981–1993.

care policies regarding graduate medical education.

Current Medicare policies still make it attractive for teaching hospitals to maintain residency programs. Not only does Medicare pay for most of the direct costs of residency training, such as residents' salaries, it also compensates the hospitals for other costs that are associated with teaching hospitals. Typically, teaching hospitals are large urban hospitals that attract more severely ill patients. The diagnosis and treatment of these patients are more costly than in non-teaching community hospitals. To compensate for these additional costs, Medicare makes extra payments to teaching hospitals based on the ratio of residents to beds. This ratio serves as a proxy measure for the increased case mix severity that accompanies being a teaching hospital.

... many deans report that their medical school is in the midst of intensive reform, yet little seems to change.

Since the size of these extra payments, referred to as indirect medical education (IME) costs, is proportional to the number of residents, teaching hospitals have a powerful incentive to increase the number of residents, especially because Medicare also pays for most of the direct costs of employing them. Besides increasing the hospital's IME revenues, residents provide skilled, cost-effective services to patients and to the attending physician staff. The presence of residents also lends prestige to a hospital. No wonder the number of house staff in Brown-affiliated teaching hospitals grew by 156% from 274 house officers in 1981 to 702 in 1993 (see Figure 1).

Pressure is mounting to reduce Medicare

payments to hospitals for IME. If this occurs, hospitals will have to shift these costs among the other third-party payers, thus making themselves more expensive to these payers than non-teaching hospitals unless the costs attributable to educational activities are identified and reimbursed separately. This scenario is likely to occur if no health care reform proposals are enacted that would compensate teaching hospitals in some way other than through charges billed to patients or their insurers. Medicare IME payments may slowly decrease as the federal government tries to restrain its health care expenditures. Private insurers already provide significant subsidy to medical education through undefined components of their reimbursements to teaching hospitals and may be asked to bear an even larger share of these educational costs. Managed care organizations will try to avoid these costs by shunting their admissions away from the more expensive teaching hospitals.

Teaching hospitals are likely to meet this threat by diluting these costs through acquiring other profitable revenue sources, by shedding their residency programs in high cost areas, by seeking separate additional revenue streams for medical education costs, or by combinations of these strategies. Private insurers are currently discussing the concept of a separate medical education trust to be funded by taxing insurance premiums.

Hospitals that pursue the first strategy will purchase the practices of primary care physicians to create a captive referral network that will keep the hospital beds occupied. Such hospitals will then be able to cross-subsidize an inpatient operating loss with an expected outpatient revenue surplus. This is analogous to how General Motors admixed the losses from its Cadillac

division with profits from its small car divisions during the energy crisis.

The teaching hospitals that are likely to succeed with this strategy are those with sufficient capital resources to secure a very sizable share of the total market, that possess high visibility and prestige, and that have few, if any, competitors of comparable size. Their ambulatory primary care revenue will be so large as to effectively eliminate the effect on price of their inpatient services. For hospitals and their primary care networks that do not attain this size, their overall costs will become significantly higher than competing managed care plans. If these costs become reflected in higher premiums, these teaching hospital integrated health care plans will lose enrollment and succumb.

Since the competency-based curriculum stresses the application of knowledge in tasks that the students will be doing as physicians, basic sciences and clinical medicine will necessarily be more closely integrated.

Managed care plans will need to establish referral relationships for the sophisticated, high technology care offered in teaching hospitals. In southern New England, many hospitals offer these services and will vie intensely with each other for referrals. Since the need for such services for any single individual represents only a remote possibility, choice of health plan will not be greatly influenced by the referral arrangements for tertiary care. Most enrollees will be more interested in where they would be hospitalized for the more common causes. Factors such as location, convenience, and a culturally comfortable environment will carry far more weight with most prospective enrollees than academic reputation. Many of the attributes of major teaching hospitals—immense size, inner-city location, ethnically and socioeconomically mixed population, “student doctors”—are actually disincentives for enrollment by the average suburbanite. Given these marketing realities, managed care plans will be able to drive hard bargains with tertiary care hospitals, bypassing a nearby one for another even an hour away in a different state for better price or higher status at the same price.

In this environment, many teaching hospitals may choose to shed certain of their tertiary care services and related residency programs. This will be accelerated in an

unregulated, highly competitive market in which Medicare reduces its IME payments and payments for once lucrative procedures are driven down by bargain-hunting managed care organizations with massive market clout.

On the other hand, a strong possibility exists that legislation will change drastically the way graduate medical education is financed and organized. Instead of financing GME through cross-subsidies from patient care revenue, a separate fund could finance both the direct costs of medical education and provide relief to those hospitals that bear a disproportionate share of severely ill and socioeconomically disadvantaged patients. This separate fund could derive its revenues either through taxes, or, more likely, through assessments on premiums paid for health insurance, the so-called all-payer system.

Under such a system, hospitals will wish to maintain their residency programs and tertiary care services, since the costs will not be reflected in what hospitals have to charge insurance carriers or managed care plans. However, with such a system will also come much greater accountability and regulation of graduate medical education. This introduces the second major force shaping GME: the perceived shortage of primary care physicians and surplus of specialists.

Most health system reform proposals and many influential groups seek to redress the perceived imbalance between generalist physicians and specialists by having a majority of medical school graduates enter careers in primary care. Often cited as evidence of this imbalance is the fact that only 30% of active physicians in the United States are generalists (family practice, general practice, general internal medicine, and general pediatrics), whereas other countries have 50% or more of their physician work force in primary care.

This ratio of 50:50 does not take into account the total number of physicians in the country. For example, while more than half of the physicians in the United Kingdom are general practitioners, the ratio of generalists to population is nearly identical in the United Kingdom (1 to 1758) and in the United States (1 to 1769).² This reflects the much greater number of total physicians per capita in the US. The current ratio of physicians to population in the US is about 260 physicians per 100,000 population, and is expected to rise to 300 per 100,000 within the next 10 years. If 50% of physicians in 2004 were generalists, there would be one primary care physician for every 667 persons, which most would consider to be too

many doctors for too few patients. However, such a ratio would be achieved only if every graduate since 1993 entered primary care. If half of the graduates entered primary care, it would take until the year 2040 to reach the goal of 50% in primary care practice.³ As it is, only about 19% of graduates surveyed in 1993 indicated an intention of going into a generalist career.

The 50% goal is really more of a politically symbolic statement than a rigid numerical goal. It represents a position that our current production of physicians is seriously flawed. We are licensing too many physicians, and too many of them are in non-primary care specialties. Too many young physicians trained in general internal medicine are continuing their training to qualify as subspecialists in internal medicine. The policy direction taking shape is to reduce the total number of graduate medical education training positions while modestly increasing the number of training positions in primary care. Under this scenario, the total number of residents would fall from the current 86,000 to the 70,000–75,000 range, with all of the reduction coming from non-primary care specialties.

The vast majority of the American population will be enrolled in managed care plans that will compete with each other largely on the basis of price, perhaps to the detriment of quality of care.

Which programs would be cut? As stated previously, hospitals would want to maintain their residencies under an all-payer financed GME system. Most proposals suggest that educational quality should be the major determinant of which programs remain and which are cut. Additional factors that would be considered are the number of underrepresented minority graduates historically enrolled in a residency program, service to underserved areas, and geographical considerations.

The decisions to cut residency programs are likely to be so contentious that a mechanism similar to military base closings may be used. An independent commission would study the matter, obtain advice from professional societies and other interested parties, and make a final recommendation. Congress would be allowed to vote the recommendation up or down but would not be allowed to amend it.

With all the above discussion taken into account, what is the future of GME for Brown University School of Medicine and the state of Rhode Island? Brown's deci-

sions will be guided by its primary mission: educating medical students. If the nation continues to move in the direction of increased competition, the medical school has three options. First would be to pick the hospitals most likely to prevail in such a competitive marketplace and establish close ties with these hospitals. This consortium would then pursue the acquisition strategy previously described, hoping to secure a large enough share of the market to guarantee the population and revenue base necessary for good medical education, without triggering antitrust concerns.

In this arrangement, Brown and its partners would become participants on the competitive field of play. Medical schools taking this approach include the University of Pennsylvania, Tufts University, and George Washington University.

Alternatively, the medical school could opt not to "pick winners" among the hospitals, instead focusing on individual faculty appointments and diminishing the role of institutional affiliation. Under this theoretical and highly improbable scenario, the medical school would specify the expectations it would have of a faculty member in terms of teaching and scholarship. Appointment would be contingent upon guarantees that sufficient time and effort would be available to pursue those activities. For those individuals in the employ of hospitals or other health care organizations, the employer also would have to guarantee that the conditions of employment included provisions designed to permit the prospective faculty member to pursue appropriate academic activities. In recognition of the organization's willingness to guarantee time for those academic activities, Brown could decide to designate it as an affiliated institution.

Hospitals will purchase the practices of primary care physicians to create a captive referral network that will keep the hospital beds occupied.

In this latter arrangement, Brown and the affiliated institutions would not have direct financial involvement with one another. Hospitals would benefit by having the academic affiliation, without which they would not be able to maintain their residency programs. Other health care organizations would benefit from the affiliation in terms of status and recruitment and retention of physicians.

Another approach altogether would be to eschew the competitive model, having



Fig 2.—Faculty of the Brown University School of Medicine, 1975–1993.

Brown facilitate a cooperative model for health care in Rhode Island. This might include the active participation of the state through its Health Department, with associated state agency immunity against antitrust laws. In this model, all hospitals in the state, not just the currently affiliated hospitals, would work together to plan a rational health care system, including graduate medical education. Given the small and compact nature of Rhode Island, tremendous opportunities exist for research, shared resources, and intelligent planning. A state-based all-payer system would finance GME and make decisions about the total number of residency positions and the specialty distribution based on the needs of the state and the national and international mission of the medical school.

In any of the scenarios described above, several outcomes seem inevitable. The number of hospital beds and the number of hospitals will decrease. In the competitive model this will result from strategic mergers, acquisition by larger hospital chains, and hospital failures. In the cooperative model it will result from rational planning based on geography and health care needs.

The number of residency positions will decrease. This will occur exclusively in non-primary care specialty areas. Some residency programs may disappear altogether, especially under the competitive model. In the statewide cooperative model, it is possible that a complete spectrum of residency programs might continue to exist within Rhode Island, but many would be smaller. The number of primary care residency positions will increase, largely due to a con-

version of preliminary and categorical internal medicine positions to primary care positions.

The number of faculty members will fall. Figure 2 shows the staggering increase in the number of faculty, from a total of 460 in 1975 (the year the first class of Brown MDs were graduated), to 1467 this year—an increase of 219%. During this period, the number of medical students rose only 19%, thus reflecting the fact that the rise in the number of faculty is more related to GME and other issues than to medical student teaching. As the number of residencies falls, the number of faculty should decline proportionately.

The policy taking shape is to reduce the total number of graduate medical education training positions while modestly increasing the number of training positions in primary care.

The decline in total numbers of faculty may occur almost exclusively among full-time faculty. The number of clinical faculty could very well stay the same or even increase. Under the competitive models, the medical school will seek to increase the network of primary care physicians available to refer patients to the teaching hospitals. Clinical faculty appointments could be offered to referring physicians who are willing to participate in ambulatory teaching of students and residents.

A remote possibility also exists that decreases in hospital educational funds will

cause non-surgical and other non-primary care specialists to move from hospitals to multispecialty group practices for their training. In an analogous fashion to lawyers, these groups will employ as "junior partner" apprentices those doctors who have completed 1 or 2 years of general postgraduate training and are licensed to practice medicine. These junior members of the practice could generate revenue more than equal to their salary as they acquired the knowledge and skills of the specialty. Eventually, some would become full partners in the practice. The specialty boards would have to amend their rules to permit practice-based rather than hospital-based training. While the status of the employer would change, the training of the specialist would remain very much the same, especially as more and more care is rendered in the ambulatory setting. Clinical faculty appointments could be given to physicians in these training practices.

Conclusion

Medical schools and hospitals are resilient institutions that have been able to adapt

successfully to changes in the environment in which they exist. Though the situation is too much in flux at present to state with confidence the exact means by which these institutions will adapt, little doubt can exist that some will succeed.

The medical school of the future will look very much the same from the outside, though the number of full-time faculty will be fewer. A closer look, however, will reveal exciting changes in the curriculum, with students actively engaged in acquiring competence in those areas of knowledge and skill designed to match them well to the demands of the future health care market.

Hospitals will look different in 10 years. They will become part of multiservice institutions in which most activity will occur in the outpatient arena. They will still be intensively engaged in teaching and research, thus enhancing the quality of health care for the people of Rhode Island. As primary care increases in importance, more of the teaching and research will be in this area with particular focus on outcomes research.

The interface between the medical school and the hospitals is too fuzzy to see clearly

at this time. Much depends on the political climate in the state and in the nation. The medical school will do whatever the situation requires to fulfill its educational mission and continue its record of contributions to Rhode Island and the region.

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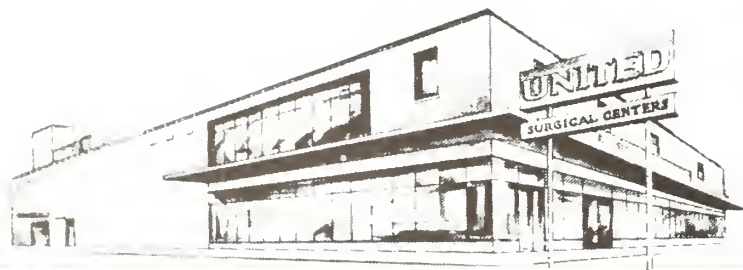
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The Brown University School of Medicine Class of 1994

Stephen R. Smith, MD, MPH

On May 30, 81 men and women received the Doctor of Medicine degree from Brown University, representing the 20th class of physicians graduated from that institution in this century. If this class follows the pattern of preceding classes, approximately 14% will eventually enter the practice of medicine in Rhode Island. Of the 1336 physician graduates of previous classes, 191 (14.3%) are currently practicing in Rhode Island, including interns and residents.

The purpose of this article is to introduce the graduates of the MD Class of 1994 to the physician community in Rhode Island, since many will be your future professional colleagues.

A Portrait of the Class of '94

Fifty graduates were men (62%) and 31 were women (38%), about the same proportion as the previous year. Historically, the balance between the sexes has been closer. Excluding this year's graduates, the medical student body is currently 51% female.

The racial/ethnic composition of the 1994 class, as shown in Table 1, shows a major change from the previous year in the proportion of students of Asian-American backgrounds. The proportion more than doubled, from 18% in the Class of 1993 to 37% in the present class. This trend was predicted, since about half of the students in the first 4 undergraduate years of the 8-year Program in Liberal Medical Education (PLME) are Asian-American. Only 7% of the graduates are members of minority groups underrepresented in medicine (5 African-American and 1 Puerto Rican) as defined by the Association of American Medical Colleges. This number is disappointingly low, but should rise in future years based on more successful recruiting of underrepresented minority students in the PLME. For the past 2 years, about 20% of freshmen college PLME students have been from underrepresented minority groups.

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One-quarter of the class (20 graduates) are residents of Rhode Island. The Rhode Island students in this year's graduating class came from 16 different communities in the state, with three from Providence, two each from Cranston and Lincoln, and one each from Coventry, Cumberland, East Greenwich, Jamestown, Narragansett, Pawtucket, Portsmouth, Riverside, Saunder-

Table 1.—Demographic Characteristics of the MD Graduates of the Brown University School of Medicine Class of 1994

	No.	Percent
Sex		
Male	50	61.7
Female	31	38.3
Race		
White	44	54.3
Asian	30	37.0
African American	5	6.2
Puerto Rican	1	1.2
Hispanic	1	1.2
State of Residence		
Rhode Island	20	24.7
New York	19	23.5
New Jersey	10	12.3
Massachusetts	5	6.2
California	4	4.9
Connecticut	4	4.9
Illinois	3	3.7
Pennsylvania	3	3.7
Florida	2	2.5
Maryland	2	2.5
Oregon	2	2.5
Other States	5	6.2
Other Countries	2	2.5

stown, South Kingston, Westerly, and Woonsocket. The high schools from which the students graduated equally reflects this diversity, with two students having attended Lincoln High School and the rest having come from 18 different high schools.

The MD Class of 1994 reflects the growing proportion of students from the PLME, with 36 such graduates (44%) having come through that route. The second largest cohort of students (22 graduates) came through the combined Brown-Dartmouth Medical Education Program in which students spend their first 2 years of medical school at Dartmouth, then transfer to Brown for the final 2 years.

Perhaps the clamor for fewer medical specialists and the increasingly competitive climate in health care are having an effect on students' career choices.

The medical school entered into special agreements with four postbaccalaureate pre-medical programs (Bennington College, Brown University, Bryn Mawr College, and Columbia University) shortly after the PLME was inaugurated. Students from these programs decided upon a career in medicine only after completing college. Typically, they have been engaged in other careers for several years following college. The goals in establishing this new route of admission were to maintain a rich diversity in the student body by admitting students who were older and who had different academic and life experiences as well as rounding out the total class size to compensate for the expected attrition from the PLME.

Postbaccalaureate students represented 19% of the graduates. Of the 15 postbaccalaureate students, 2 came from Bennington College, 7 from Bryn Mawr College, and 3 each from Brown and Columbia University.

The remainder of the class was comprised of five students who were part of the Early Identification Program at Providence College (1 student) and the University of Rhode Island (4 students). These latter students were offered provisional admission to the medical school during their sophomore year at their respective undergraduate colleges. Finally, the remaining three graduates were from the older 7-year Medical Education Program (the student obtained a PhD degree along the way), the traditional premedical admission route (no longer available), and an advanced transfer student.

Brown University was the most frequent undergraduate college among the graduates, accounting for 40 graduates (49%). The University of Rhode Island ranked second with 8 members of the Class of 1994 having that school as their alma mater. Altogether, the 81 graduates of the Class of 1994 came from 26 different colleges and universities.

The most frequent undergraduate major among the class members was biology (including subdisciplines such as genetics,

ABBREVIATIONS USED

PLME: Program in Liberal Medical Education

Table 2.—Specialty Choices of the MD Graduates of the Brown University School of Medicine Classes of 1990-94

Specialty Choice	Graduating Class									
	1990		1991		1992		1993		1994	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Primary Care, total	34	(44.2)	29	(38.7)	43	(56.6)	33	(45.8)	39	(52.0)
Internal Medicine, total	15	(19.5)	15	(20.0)	22	(28.9)	20	(27.8)	23	(30.7)
Categorical Medicine	13	(16.9)	13	(17.3)	16	(21.1)	16	(22.2)	20	(26.7)
Primary Care Medicine	2	(2.6)	2	(2.7)	6	(7.9)	4	(5.6)	3	
Pediatrics	10	(13.0)	10	(13.3)	11	(14.5)	4	(5.6)	10	(13.3)
Family Medicine	8	(10.4)	4	(5.3)	10	(13.2)	9	(12.5)	6	(8.0)
Medicine/Pediatrics	1	(1.3)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Surgery	10	(13.0)	9	(12.0)	2	(2.6)	2	(2.8)	7	(9.3)
Surgical Subspecialties, total	4	(5.2)	6	(8.0)	9	(11.8)	10	(13.9)	8	(10.7)
Ophthalmology	3	(3.9)	3	(4.0)	6	(7.9)	2	(2.8)	2	(2.7)
Orthopedics	0	(0.0)	2	(2.7)	1	(1.3)	3	(4.2)	4	(5.3)
Neurosurgery	0	(0.0)	0	(0.0)	1	(1.3)	1	(1.4)	0	(0.0)
Urology	1	(1.3)	1	(1.3)	0	(0.0)	2	(2.8)	1	(1.3)
Plastic Surgery	0	(0.0)	0	(0.0)	0	(0.0)	1	(1.4)		
Otorhinolaryngology	1	(1.3)	1	(1.3)	1	(1.3)	1	(1.4)	1	(1.3)
Emergency Medicine	1	(1.3)	3	(4.0)	3	(3.9)	2	(2.8)	1	(1.3)
Obstetrics & Gynecology	4	(5.2)	8	(10.7)	6	(7.9)	6	(8.3)	5	(6.7)
Psychiatry	1	(1.3)	2	(2.7)	4	(5.3)	3	(4.2)	7	(9.3)
Neurology	1	(1.3)	2	(2.7)	3	(3.9)	3	(4.2)	1	(1.3)
Transitional	7	(9.1)	3	(4.0)	1	(1.3)	8	(11.1)	3	(4.0)
Institutional Specialties, total	13	(16.9)	10	(13.3)	5	(6.6)	5	(6.9)	4	(5.3)
Anesthesiology	3	(3.9)	1	(1.3)	1	(1.3)	2	(2.8)	0	(0.0)
Pathology	0	(0.0)	1	(1.3)	2	(2.6)	1	(1.4)	0	(0.0)
Rehabilitation Medicine	1	(1.3)	1	(1.3)	1	(1.3)	1	(1.4)	1	(1.3)
Radiology and Radiation Oncology	9	(11.7)	7	(9.3)	1	(1.3)	1	(1.4)	3	(4.0)
Totals*	77 (100.1)		75 (99.9)		76 (99.8)		72 (100.0)		75 (99.9)	

*Excludes those not entering residency training in the same year of graduation. Totals do not add to 100.0 due to rounding

neural sciences, molecular biology, etc.), with 52% the class selecting that as their undergraduate field of study. Science majors taken together accounted for 69% of all majors, while 16% majored in the humanities, 15% majored in the social sciences.

Table 3.—State in Which the First Year of Residency Training is Located for the Brown University School of Medicine MD Class of 1994

State	No.	(%)
California	7	(8.6)
Connecticut	4	(4.9)
District of Columbia	5	(6.2)
Illinois	2	(2.5)
Maryland	5	(6.2)
Massachusetts	10	(12.3)
Michigan	1	(1.2)
Minnesota	2	(2.5)
Missouri	2	(2.5)
New York	11	(13.6)
Oregon	2	(2.5)
Pennsylvania	1	(1.2)
Rhode Island	16	(19.8)
United Kingdom	1	(1.2)
Vermont	1	(1.2)
Washington	4	(4.9)
Delaying Residency	7	(8.6)
Total	81	(99.9)*

*Total does not equal 100 due to rounding

Among the humanities majors, art history and comparative literature were tied as the most common choices, while health and society was the most popular choice among those majoring in the social sciences. These data portray a continuing trend toward a broader range of undergraduate majors, reflecting the larger proportion of postbaccalaureate and PLME students in this class. The postbaccalaureate and PLME students were less likely to be science majors than

were traditional premedical students or the seven-year MEP students.

Where They Are Going

Internal medicine remains the most frequently selected specialty. The proportion of the graduates entering internal medicine is slightly higher than last year. There appears to be an upward trend toward career selection in internal medicine, as shown in Table 2.

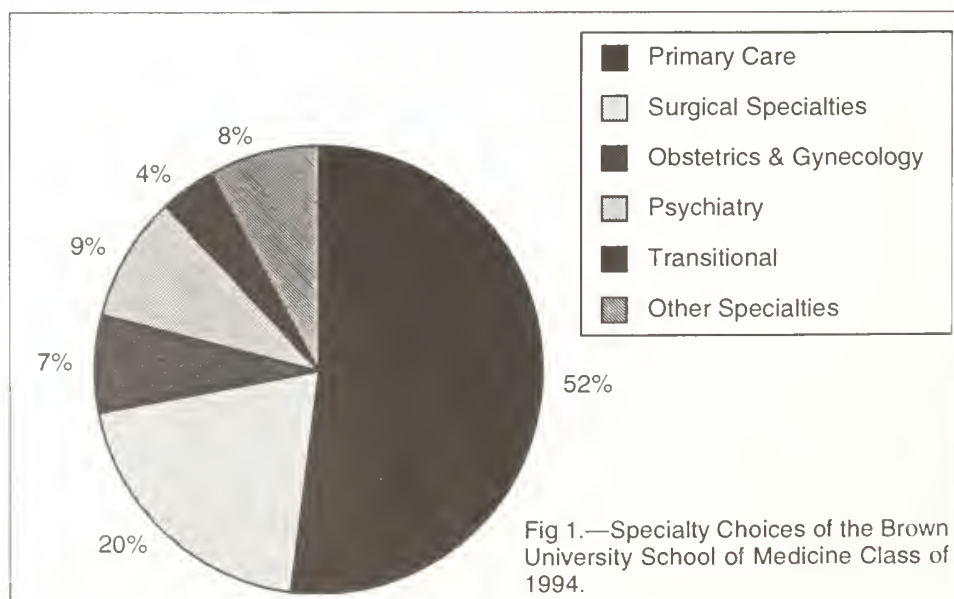


Fig 1.—Specialty Choices of the Brown University School of Medicine Class of 1994.

The proportion of the class entering specialties in primary care increased to just over half the class. This includes the fields of internal medicine, pediatrics, and family practice. The proportion of the class going into pediatrics was back up to its usual levels after an unusual dip last year. Figure 1 illustrates the specialty choices of the Class of 1994.

Table 4 lists the Class of 1994 graduates and where they will be going to do their residency training. Of the 74 graduates who will enter residency training next year (7 are delaying their residencies for 1 year), 16 graduates (22%) matched with Brown-affiliated residency programs and will be staying in the state. Next to Providence, New York City attracted the most members of the Class of 1994 for their first year of training (10 graduates), with Baltimore and Washington, DC, each receiving 5 graduates for their first year of residency training. The greater Boston area will have 6 of our graduates, 4 of whom will be in Boston

proper, and 2 more in nearby Cambridge.

New York State will be the home for 11 graduates next year and ranks second to Rhode Island as the most popular state for residency training. Table 3 lists those states where the graduates will be going for their first year of residency training. As with preceding classes, this class overwhelmingly preferred the Northeast and West Coast to the South and Central states. Two-thirds will be spending their first year of residency in the Northeast and one-sixth on the West Coast. In contrast, only 7 students (9%) will be in the Midwest, and no students chose to go to the South.

Conclusion

The pattern of career choice of the MD Class of 1994 shows some encouraging signs. Over half of the graduates have entered training in primary care specialties, though many will probably subspecialize, especially those selecting categorical programs in internal medicine. The large in-

crease in general surgery is also encouraging. Though general surgery is not a primary care specialty, a shortage of general surgeons also exists, particularly in smaller communities. Psychiatry, another under-subscribed specialty nationally, grew in attractiveness among Brown graduates. Reciprocally, the proportion of graduates selecting residency training in the surgical subspecialties and institutional specialties has decreased.

It is not clear what the causes of these modest trends are. Perhaps the clamor for fewer specialists and the increasingly competitive climate in health care are having an effect on students' career choices. The trends will be closely monitored in the coming years.

Acknowledgments

My thanks to Ruth Sauber and Marilyn Doyle in the Office of Medical Student Affairs, Brown University School of Medicine for assistance in summarizing the data.

Table 4.—Brown University School of Medicine Class of 1994 Residency Positions

Name of Graduate	Hospital Name/Medical School Affiliation	Specialty
Abraham, Ann	St. Paul-Ramsey Medical Center/Univ of Minnesota	Family Medicine
Acker, Mark	Rhode Island Hospital/Brown University	Pediatrics
Akatsu, Haruko	Stanford University Hospital/Stanford University	Internal Medicine
Ambroise, Carl	Medical Center Hospital of Vermont/Univ of Vermont	Surgery
Bartholet, Thomas	Barnes Hospital/Washington University	Internal Medicine
Bassi, John	Rhode Island Hospital/Brown University	Surgery-Prelim
	Brown University Affiliated Hospitals/Brown University	Urology
Beade, Paul	Lenox Hill Hospital/New York University	Internal Medicine-Prelim
	Manhattan Eye, Ear & Throat/Cornell University	Ophthalmology
Berard, Dennis	Rhode Island Hospital/Brown University	Pediatrics
Blumenthal, Jacob	University of Michigan Hospitals/Univ of Michigan	Internal Medicine
Brown, Kirk	Roger Williams Medical Center/Brown University	Internal Medicine-Prelim
	Hospital of St. Raphael/Yale University	Radiology-Diagnostic
Chalfin, Michael	Cambridge Hospital/Harvard Medical School	Transitional
	Cambridge Hospital/Harvard Medical School	Psychiatry
Chen, Frank	Hospital for Joint Diseases/New York University	Orthopedics
Chiu, Rex	The New York Hospital/Cornell University	Medicine-primary
Chiu, Terence	McGaw Medical Center/Northwestern University	Internal Medicine
Chu, Quyen	Delaying Residency	
Costa, Michelle	University of Minnesota Hospital & Clinic/Univ of Minnesota	Pediatrics
DeQuatro, Nicole	Madigan Army Medical Center, Tacoma, Washington	Obstetrics/Gynecology
Donlon, Elizabeth	Harvard Longwood Psychiatry/Harvard Medical School	Psychiatry
Dorn, Beth	Mount Auburn Hospital/Harvard Medical School	Medicine-primary
Efron, David	Johns Hopkins Hospital/Johns Hopkins Medical School	Surgery
Fish, Keith	Miriam Hospital/Brown University	Internal Medicine-Prelim
	Memorial Sloan-Kettering/Cornell University	Radiation Oncology
Frisch, Melissa	Georgetown University Hospital/George Washington Univ	Internal Medicine
Gandhi, Rohina	UCLA-San Fernando Valley/UCLA School of Medicine	Internal Medicine-Prelim
	University of California-Los Angeles/Univ of California	Neurology
Godfrey, Gerald	Presbyterian Hospital/Columbia University	Internal Medicine-Prelim
Gold, Steven	Delaying Residency	
Grant, Nicola	Oregon Health Sciences Univ/Oregon Health Science Univ	Family Medicine
Gupta, Apurv	Beth Israel Hospital/Harvard Medical School	Internal Medicine
Hayes, Edward	Thomas Jefferson University/Jefferson Medical College	Obstetrics/Gynecology

Table 4 (cont'd)—Brown University School of Medicine Class of 1994 Residency Positions

Hemstreet, Mitzi	Roger Williams Medical Center/Brown University	Internal Medicine-Prelim
Higgins, Thomas	Yale-New Haven Hospital/Yale University	Orthopedics
Hou, Ernie	Rhode Island Hospital/Brown University	Pediatrics
Hudgins, Thomas	Evanston Hospital/Northwestern University	Internal Medicine-Prelim
	McGaw Medical Center/Northwestern University	Physical Medicine & Rehab
Hwang, Sungjun	Strong Memorial Hospital/University of Rochester	Internal Medicine-Prelim
	University of Rochester/University of Rochester	Ophthalmology
Inger, David	Swedish Medical Center/University of Washington	Family Medicine
Jacobs, Sharon	Cambridge Hospital/Harvard Medical School	Transitional
	Cambridge Hospital/Harvard Medical School	Psychiatry
Kantu, Manoj	SUNY Health Science Center-Brooklyn/SUNY	Surgery-Prelim
	SUNY at Brooklyn/State University of New York	ENT/Head & Neck Surgery
Karanja, Kamau	Einstein Affiliated Hospitals/Albert Einstein	Family Medicine
Kim, Kelly	Beth Israel Hospital/Harvard Medical School	Internal Medicine
Kuhn, Sharon Egan	Yale-New Haven Hospital/Yale University	Pediatrics
Kuo, Grace	Children's National Medical Cntr/George Washington Univ	Pediatrics
Kuperman, Marina	Mount Sinai Hospital/Mr. Sinai School of Medicine	Internal Medicine
Lawler, Sean	Children's National Medical Center/	Pediatrics
Lifrak, Joseph	Rhode Island Hospital/Brown University	Orthopedics
Lin, Foong-Yi	Rhode Island Hospital/Brown University	Pediatrics
Madhere, Shirley	University of Connecticut/Univ of Connecticut	Surgery
Meng, Charis	Mount Sinai Hospital/Mr. Sinai Medical School	Internal Medicine
Mohideen, Namita	Delaying Residency	
Nguyen, Khanh	Oakland Naval Hospital, Oakland, California	Surgery
Noel, Lauren	Rhode Island Hospital/Brown University	Pediatrics
O'Donnell, Amy	Delaying Residency	
Oliva, Jeanne	Rhode Island Hospital/Brown University	Medicine-primary
Palmisciano, Lynne	Children's National Medical/George Washington Univ	Pediatrics
Paquette, Edmond	Madigan Amy Medical Center, Tacoma, Washington	Surgery
Patton, Edward	Women & Infants Hospital/Brown University	Obstetrics/Gynecology
Philips, Philip	Baystate Medical Center/Tufts University	Surgery
Phillips, Stephanie	David Grant Medical Center, Travis AFB, California	Internal Medicine
Pigott, Gregson	Cambridge Hospital/Harvard Medical School	Internal Medicine
Putalik, Kimberly	Greater Lawrence Family Health/Tufts University	Family Medicine
Rabin, Leora	University of Washington Affiliated/Univ of Washington	Psychiatry
Rhee, Henry	Georgetown University Hospital/Georgetown University	Internal Medicine
Robinson, Emiko	Delaying Residency	
Roemer, David	Miriam Hospital/Brown University	Internal Medicine-Prelim
	Presbyterian Hospital/Columbia University	Psychiatry
Salleroli, Christian	University of California-Irvine Medical Center/Univ of Calif	Emergency Medicine
Saugy, John	Rhode Island Hospital/Brown University	Surgery-Prelim
	Catholic Medical Center/Cornell University	Orthopedics
Schlozman, Steven	Rhode Island Hospital/Brown University	Internal Medicine/Prelim
	Massachusetts General Hospital/Harvard Medical School	Psychiatry
Schweichler, Maria	Barnes Hospital/Washington University	Obstetrics/Gynecology
Shah, Monica	Johns Hopkins Hospital/Johns Hopkins Medical School	Internal Medicine
Srinivasan, Ravi	University of California-San Francisco/Univ of California	Internal Medicine
Sudanagunta, Sunita	Delaying Residency	
Taitsman, Lisa	Delaying Residency	
Ting, David (Chiapone)	Sinai Hospital of Baltimore/Johns Hopkins University	Internal Medicine
Tso, Michael	Oregon Health Sciences Univ/Oregon Health Science Univ	Family Medicine
Valerie, Evans	SUNY Health Sciences Center-Brooklyn/SUNY	Surgery
Varghese, Paul	Johns Hopkins Hospital/Johns Hopkins Medical School	Internal Medicine
Vedantham, Kumar	University of California-San Francisco/Univ of California	Psychiatry
Wolek, Robert	Bridgeport Hospital/Yale University	Radiology-Diagnostic
Yanagisawa, Robert	Delaying Residency	
Yap, Eric	Presbyterian Hospital/Columbia University	Internal Medicine
Yu, Cecelia	Baystate Medical Center/Tufts University	Obstetrics/Gynecology
Zahalsky, Howard	Francis Scott Key Medical Center/Johns Hopkins Medical	Internal Medicine

Resident Physician Abstracts: Annual Scientific Meeting of the Rhode Island Chapter of the American College of Physicians

Fred J. Schiffman, MD

The Eighth Annual Joint Meeting of the Rhode Island Chapter of the American College of Physicians (ACP) and the Department of Medicine at Brown University was held at a new location this year—the Johnson and Wales Airport Hotel—on Tuesday and Wednesday, March 22 and 23. Participation by Brown University medical residents was so great this year that scientific papers and posters were only accepted from PGY-1, 2 and 3 house staff. The submissions of subspecialty fellows could not be considered.

Posters were displayed during the Tuesday evening session in the Plantation Ballroom of the Hotel. Hors d'oeuvres were served at a reception for participants and H. Denman Scott, MD, FACP, senior vice president, Health and Public Policy, American College of Physicians, spoke about "What is an Internist—The Changing Face of the Practice of Internal Medicine."

This year, 58 posters were displayed, all of which represented the work of resident physicians and faculty from each of the Brown-affiliated hospitals. The following day in the ballroom, 16 oral presentations were given. Poster presentations from the previous evening remained standing so that participants in the Annual Scientific Meeting could view the posters and continue to talk to authors.

The first oral presentation was special this year. It represented the combined efforts of the Brown University hospitals who developed and participated in a study of abdominal radiographs in the emergency room to learn whether they were useful adjuncts in diagnosis. The faculty sponsor was Edward Feller, MD, clinical associate professor of medicine at Brown University, and chief of gastroenterology at The Miriam Hospital. The presenter of the work was Boris Coronado, MD, who is currently medical chief resident at Memorial Hospital of Rhode Island. Each of the other chief residents at participating hospitals, including

Curtis Donskey, MD, Edward Westrick, MD, Helen Cheng, MD, Alexander Massey, MD, Peter Martens, MD, and Joseph Spinale, MD, took major roles in coordinating and shaping the work that was originally suggested at a Brown interhospital residency committee meeting. Other medical residents participated in this collaborative study and, as a pilot project, it is seen as a success not only because of its scientific merit but because of the implications for future projects.

Along with that study there were other fine projects whose subjects ranged from topics in HIV infection and AIDS to novel presentations of rare and common diseases such as neurosarcoidosis presenting as impotence and herpes simplex virus pneumonia in immunocompetent hosts. Cancer pain management was discussed as well as clostridial sepsis. All orally presented abstracts are included at the end of this article.

There was a panel discussion during mid-morning: "Ethical Issues for Physicians Practicing After Health Care Reform," moderated by Joseph Chazan, MD, governor of the Rhode Island ACP Chapter. Participants were Dan Brock, Ph.D., professor and director of philosophy and biomedical ethics, Brown University; Allan S. Brett, MD, FACP, assistant professor of medicine, Harvard Medical School and Terri R. Fried, MD, assistant professor of medicine, Brown University, and Rhode Island Hospital.

James P. Nolan, MD, FACP, vice chairperson of the Board of Regents of the American College of Physicians and chief of medicine at the University of Buffalo, was the official college representative. He participated in all sessions on both days and was particularly impressed with the quality of Brown University residents and their faculty mentors.

This was Dr Chazan's 4th year as governor of the American College of Physicians. At the luncheon, his contributions to further the development of medical education in the state of Rhode Island and his strengthening of the state's ACP chapter were recounted and recognized. He received special gifts from the Governor's Council and the appreciation of all who attended.

Oral Presentations

1. Study of Abdominal Radiographs (SOAR)

B. Coronado, MD, C. Donskey, D. Daddario, MD, W. Lee, MD, P. Martens, MD, R. Maxim, MD, Hassan Rizzi, MD, J. Spinale, DO, E. Feller, MD

The ever-increasing need for cost containment mandates a rational use of these studies for the optimal delivery of health care.

In order to determine the utility of plain films of the abdomen in the emergency room setting in the adult population, we conducted a retrospective chart-review study at the major Brown University-affiliated hospitals.

All pertinent information including chief complaint, physical findings, laboratory data and radiographic interpretations were collected. Radiographic findings were divided into major (bowel obstruction, ileus, pneumoperitoneum, pneumobilia, bowel edema) and minor (calcifications, air fluid levels, dilated bowel loops, arthritic changes, increased stool content).

Of a total of 467 cases, 294 (63%) had normal films; 64 (13.7%) had major radiographic findings; and 109 (23.3%) had minor abnormalities. Abdominal distension was a good predictor of intestinal obstruction or ileus (positive predictive value 71%), whereas peritoneal signs (rigidity, guarding or rebound tenderness) predicted a major radiographic abnormality in 25% of instances, and pneumoperitoneum in only 14%. This study shows that abdominal films are unnecessary in patients without peritonism or distension, with the possible exception of cases of renal colic where suspicious calcifications may be detected. A negative film seemed to be reassuring in those patients with abnormal physical findings, as there were no films with major abnormalities in patients with normal physical exam (negative predictive value 100%). We conclude that plain films of the abdomen seem to be overutilized in the emer-

ABBREVIATIONS USED

ACP: American College of Physicians

AIDS: Acquired Immune Deficiency Syndrome

FACP: Fellow, American College of Physicians

HIV: Human immunodeficiency virus

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gency room setting in the adult population. This is shown by the small number of cases with major radiographic abnormalities, all of which exhibited an abnormal abdominal physical examination.

2. Inadequacy of Residency Training in Cancer Pain Management.

Wendy M. Stein, MA, NHA, MD.

It has been estimated that at least two-thirds of cancer patients with advanced disease will experience pain during some time during their illness. A resident survey was developed by the chairperson of the Rhode Island Cancer Pain Initiative Physician Education Committee to identify ways in which knowledge could be imparted to help primary care residents feel more comfortable managing this problem with the hope of ultimately improving the patient experience.

Anonymous surveys were distributed to approximately one-third of internal medicine and family practice residents on the wards in five university-affiliated programs representing a simple random sample.

Residents had had variable exposure to information on cancer pain management during medical school and residency. Of those who received instruction in this area during medical school clerkships (44.6%), most often this was during the medical clerkship (39.2%). Approximately 66% of residents in this sample had received some clinical instruction from an attending, but only 27% remembered instruction from one of their residents. Overwhelmingly, 95.9% of residents felt that cancer pain could be relieved, but the majority (63.5%) did not feel comfortable managing this problem. In addition, the majority (81%) of residents would like to see more training in cancer pain management at the residency level. Of those who had not had attending level instruction, 84% did not feel comfortable managing cancer pain.

Besides providing information to primary care physicians, the careful guidance of an experienced, knowledgeable attending influences the comfort of physicians-in-training in this area. This survey supports the multimodality effort of the Wisconsin Cancer Pain initiative to increase factual knowledge, legitimize the importance of pain assessment and treatment, and emphasize the importance of role modeling in the learning process.

3. "Blue-Purple Toe Syndrome" (BTS): A Rare Complication of Warfarin Therapy.

A. Khurana, MD, N. Freeman, MD, A. Carvalho, MD.

BTS associated with anticoagulant therapy has been known for 41 years. However, its incidence and pathogenesis remain unclear. We report 2 of 480 patients followed by the

anticoagulation clinic at the Providence VAMC who developed this syndrome 4-8 weeks after initiation of warfarin therapy. Both patients have atrial fibrillation and complained of burning-like pain with bluish discoloration on the plantar surface of both feet and the 1st and 5th toes, while they were within therapeutic range (INR 2.5-3.5). One patient also developed necrosis of the first toes bilaterally and the left 5th toe. Both patients had absence of peripheral vascular insufficiency, vasculitis, embolism, hyperviscosity, anti-phospholipid syndrome or essential thrombocythemia. The warfarin was discontinued in both patients. One was switched to aspirin and improved remarkably; the other with skin necrosis required heparin therapy with some improvement. One proposed mechanism for BTS is that the use of warfarin permits cholesterol debris to embolize to the skin, particularly in patients who have recently undergone an invasive vascular procedure. Other investigators reported two patients with BTS heterozygous for Protein C (PC) deficiency, and imply that warfarin further reduces the level of PC leading to thrombosis of the skin. Since heterozygosity for PC occurs in 1/250, and BTS occurs rarely, PC deficiency alone cannot explain the mechanism of the syndrome. We postulate that concomitant disturbances of antithrombin III may also contribute to the pathogenesis of BTS. These results are pending in our patients.

4. Ataxia and Dysarthria from Too Much Pasta.

Boris E. Coronado, MD, David C. Yoburn, MD, FACP.

Unusual and transient neuropsychiatric symptoms such as dysarthria, confusion, ataxia and cranial nerve palsies have been described in patients who have undergone jejunoileal bypass for the treatment of obesity or in those with short bowel syndrome from other causes. These symptoms correlate with the episodic appearance of a high-anion gap metabolic acidosis that results from increased production of D-lactate by the intestinal microflora.

We present the case of a 50-year-old man with steroid-dependent COPD who, in 1975, underwent jejunoileal bypass for the treatment of obesity. Two days before admission and shortly after ingesting an unusually large carbohydrate-rich pasta meal, he developed progressive dysarthria, ataxia, and generalized weakness.

Upon admission to the hospital his physical examination revealed mild leg weakness and dysarthria. Laboratory data showed a sodium of 138 mEq/L, chloride 107 mEq/L, bicarbonate 18 mEq/L, and arterial blood gases on room air with a pH of 7.29, pCO₂ 24 mmHg,

pO₂ 114 mmHg, and a calculated bicarbonate of 12 mEq/L. BUN was 8 mg/dl, creatinine 0.8 mg/dl, and blood glucose 72. Serum ketones were undetectable.

By the next day his symptoms and metabolic acidosis had resolved spontaneously. Repeat sodium was 133 mEq/L, chloride 104 mEq/L, and bicarbonate 25 mEq/L. Computed tomography of the head and serum and urine toxicology screens were negative.

Plans are being made for provocative testing with carbohydrate, loading and serial serum and urine determinations for D-lactate.

The altered gastrointestinal anatomy in patients such as this one promotes the overgrowth of gram positive bacteria of the lactobacillus species, which metabolize dietary carbohydrate into D-lactate. When large amounts of carbohydrate are ingested there is increased production of D-lactate, which is, in turn, absorbed and thought to account for the neurological manifestations.

Although the exact mechanism by which D-lactate induces central nervous system dysfunction is not known, several theories have been postulated. Oral antibiotics and dietary modifications have been used for treatment with some success. Further studies are needed to determine the precise biochemical abnormalities and to establish appropriate acute and long-term treatment regimens.

5. The Stink of It. Classical Conditioning to an Odor.

Carlos Arquello, MD, David Kern, MD.

Persistent psychologic reactions such as panic with hyperventilation and post-traumatic stress disorder (PTSD) often follow chemical exposure incidents. Classical (Pavlovian) conditioning in which the odor of a chemical at subirritant concentrations becomes a conditioned stimulus has been hypothesized to explain such reactions. However, in no reported case has a challenge test been conducted as proof. A 42-year-old male psychiatric hospital attendant was referred to the Memorial Hospital of Rhode Island's Occupational and Environmental Health Service for suspected recurrent acute organophosphate intoxication (OPI). Over the preceding 2 years, each time his workplace was sprayed with Dursban (chlorpyrifos), the patient acutely developed nausea, headache, dizziness, and an "out of body experience," lasting from 8 to 72 hours. We determined that the patient's illness was not consistent with OPI, but he did have features suggesting hyperventilation and PTSD. This raised the possibility of a relationship between PTSD and the hyperventilation syndrome. We conducted a single-blind placebo controlled challenge to test the hypothesis that the patient was responding to the odor of

the pesticide solution and that symptoms were mediated by hyperventilation. The patient was studied by continuous monitoring of VO_2 , VCO_2 , minute ventilation (VE), tidal volume, respiratory rate, and respiratory quotient. With nose clips in place, he was unable to distinguish the Dursban solution from water or from isopropyl alcohol and on sequential challenges he demonstrated no change in respiratory parameters. When the nose clips were removed and the testing sequence repeated, the patient developed a striking symptom complex coincident with a doubling of his ventilation to 17 liters per minute. To better assess the role of hyperventilation, the patient was restudied later with incremental hyperventilation. Ventilation up to 45 liters per minute elicited no symptoms. We conclude that the patient's recurrent syndrome represents classical conditioning to an odor and that hyperventilation was a manifestation of this syndrome rather than its cause.

6. Fatal Clostridial Sepsis with Massive Intravascular Hemolysis and No Known Source.

Anjum Baqai, MD, Steven Opal, MD.

A previously healthy 66-year-old woman, presented with a 2-day history of bilateral flank pain, lower abdominal pain and arthralgia. She had noted nausea and vomiting 1 day earlier but no diarrhea, fever or chills. On initial examination she appeared alert and comfortable but exhibited pallor, fever (101.5°) and tachycardia. She quickly deteriorated with progressive dyspnea and cyanosis and developed hypotension requiring intubation and vasopressors. Initial blood count revealed a WBC of $28,000/\text{mm}^3$ and was markedly hemolyzed with a hemoglobin 3.9 gm/dl and a hematocrit of 3.5%. The indirect bilirubin was 25.0 mg/dl; the peripheral blood smear showed RBC ghost cells. These findings suggested severe intravascular hemolysis. A DIC screen was negative: Her blood gas analysis revealed severe hypoxemia and anion gap metabolic acidosis. CXR showed pulmonary edema. She was transferred to ICU and treated with IV clindamycin, gentamicin and penicillin. In spite of all supportive measures, she developed progressive bleeding and hypotension and died 8 hours after admission. Multiple blood cultures grew *Clostridium perfringens*. Autopsy showed hemoglobin staining of multiple organs, hemoglobin nephrosis and pulmonary edema. Post-mortem blood cultures revealed *Clostridium* and *Klebsiella* species. One intact, non-inflamed diverticula of sigmoid colon was identified. No potential portal of entry for the organism was found at autopsy.

Clostridium perfringens is an anaerobic

gram-positive rod that causes a wide spectrum of clinical manifestations when isolated from the blood stream. Massive hemolysis with shock and death is a well-known complication with septic abortion but is rarely observed in other pathologic states. Patients with GI or GU malignancy or trauma may develop this syndrome. Our case represents the 2nd case reported in which no portal of entry was found.

7. Lovastatin Associated Rhabdomyolysis: A Case Report and Review of Literature.

J. Lim, MD, F. Tan, MD.

Lovastatin alone or in combination with other drugs, notably with other lipid-dwelling agents or with cyclosporine, have been reported to cause significant rhabdomyolysis. We report an unusual case of massive rhabdomyolysis with a fatal complication resulting from concomitant use of lovastatin and nicotinic acid and the likely role of exercise as a triggering factor. This paper will also review risk factors for acute renal failure with lovastatin-induced rhabdomyolysis.

A 68-year-old white male with known history of HTN, s/p MI was admitted for an incidental finding of an elevated serum creatinine. Patient was relatively well until 3 weeks before admission when he underwent a stress thallium for evaluation of recurrent chest pain. Results showed reversible ischemia and cardiac catheterization was planned. Two weeks before admission patient noted darkening of his urine. Two days before admission, the patient slipped on ice in a "spread eagle position." He experienced diffuse pain over his buttocks and right thigh for the next 2 days. Medications on admission consisted of diltiazem 30 mg po tid, lovastatin 40 mg po bid, nicotinic acid 500 mg po bid, lisinopril 20 mg po qd, nadolol 80 mg po qd. Physical examination on admission was remarkable for the presence of tenderness over the buttock area, right thigh, and absence of any ecchymoses. Laboratory revealed the following: Na-134 mEq/L, K-4.6 mEq/L, Cl-88 mEq/L, CO_2 -21 mEq/L, BUN-113 mg%, creat-9.2 mg%, AST-2614 IU, ALT-903 IU, T. Bill-0.4, Alk Phos-87, CPK-207,600. Urinalysis showed a brownish cloudy color, SG-1.016, pH-6.0, + 3 protein, (+) blood, WBC-15/hpf, RBC-0/hpf, no casts and a urine myoglobin of 1,250 ng/ml.

Patient's rhabdomyolysis peaked with a CPK of 413,200 and was complicated by progressive acute renal failure necessitating dialytic support. On the 4th HD patient suffered an acute MI and subsequently expired. Postmortem revealed muscle tissue showing extensive myofiber degeneration and a renal histology consistent with ATN.

This case underscores the observation that

patients concomitantly using lovastatin and nicotinic acid are at risk to develop rhabdomyolysis and that exercise may precipitate this event. The massive rhabdomyolysis (peak CPK of 413,200) is the highest reported in literature and his subsequent minor trauma played a role in the severity of his rhabdomyolysis. Review of literature suggests a role of strenuous activity in initiating rhabdomyolysis in patients who are concomitantly on lovastatin and with other lipid lowering agents.

8. Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV) in Women—A Retrospective Chart Review.

Denis I. Keohane, MD, Timothy Flanigan, MD, Edward Feller, MD, Charles C.J. Carpenter, MD.

HIV and HBV share similar transmission routes, namely parenteral and sexual modes. Sparse data exist concerning the HBV status of HIV-infected women. To clarify this relationship, we undertook a retrospective chart review at three hospital centers that included 218 women.

In the entire cohort, the incidence of past or present HBV infection was 143 of 218 (66%). For women with IDU as their risk behavior, incidence of coinfection was 113 of 130 (87%). For those with unprotected heterosexual exposure, the incidence was 28 of 82 (34%).

When evaluated by serologic pattern of HBV positivity the results were as follows: For IDU, 6 women had HBsAb alone, 47 had HBcAb alone and 57 had HBsAb/HBcAb positivity. For heterosexual exposure, 4 women had HBsAb alone, 6 had HBcAb alone and 18 HBsAb/HBcAb. Surprisingly, only 3 women had persistence of HBsAb/HBcAb, and all 3 had IDU as their risk behavior.

Our data suggest that IDU represents the highest risk behavior for coinfection of HIV and HBV in women. Our results also show a low rate of persistent Hepatitis B virus surface antigenemia and a high rate of isolated HBcAv positivity in women who are coinfecting as compared to prior studies of coinfecting men.

9. HIV and M. Tuberculosis: How Strong a Relationship?

S.C. Mistry, BSc, B.H. Foresman, DO.

From 1969 to 1983, antituberculous chemotherapy effectively reduced the incidence of *Mycobacterium tuberculosis* (MTB) by 3.5% per year, nationally and by 3.3% per year in Texas. However, since 1985 the incidence of MTB in both regions has plateaued and subsequently increased despite extensive preventive public health programs. As a result, several authors have attributed these deviations to changing risk factors such as increased

crack cocaine use, socioeconomic factors, and reduced public health funding. Some investigators are now suggesting that infection with HIV rather than other factors is the major etiologic determinant of these changes. Because of this controversy, we sought to determine if the increase in HIV-related MTB (HIV+MTB) could account for the deviation of MTB cases from the expected decline. We reviewed the annual tuberculosis reports for Texas and used a log-linear regression analysis of the MTB cases for 1969 through 1983 to obtain the estimated MTB cases for the years 1984 through 1991. The difference between the actual and predicted incidence (MTB_{Diff}) was then compared to the frequency of HIV+MTB. (See table below.)

Year	'84	'85	'86	'87	'88	'89	'90	'91
HIV+MTB	12	27	48	83	104	123	143	184
MTB_{Diff}	—	62	110	—	215	274	645	970

These data suggest that while HIV-related MTB is increasing and accounts for 50% of the MTB_{Diff} from 1985 through 1989, the significant increase in MTB seen after 1989 cannot be readily attributed to the continuing trend of HIV infections and is probably due to other factors, yet to be explored.

10. Herpes Simplex Virus Pneumonia in Two Immunocompetent Hosts.

L. Ellen Brackett, MD, Ron Gilman, MD, Walter Donat, MD, C.B. Sherman, MD.

Herpes simplex virus (HSV) infection can involve the lower respiratory tract but usually only in the compromised host. We report two cases of HSV pneumonia developing in immunocompetent patients.

The first case was a 69-year-old white woman with no previous medical problems who underwent successful resection of a left upper lobe squamous cell carcinoma. Post-operatively, she developed a diffuse right-sided infiltrate. Despite broad spectrum antibiotic coverage, the infiltrate persisted, and she developed worsening hypoxemia. Bronchoscopy was performed and revealed only diffuse bronchial mucosal erythema. Bronchial washings were negative for bacteria, *Legionella*, mycobacterium and fungus; however, herpes simplex virus type 1 was cultured. The patient was started on acyclovir. Shortly thereafter, she progressed to multi-organ failure and expired. The diagnosis of HSV pneumonia was confirmed by post-mortem examination.

The second case was a 72-year-old man with known COPD and severe coronary artery disease who was admitted to the hospital for treatment of CHF and possible concurrent pneumonia. Despite aggressive diuresis and broad spectrum antibiotic treatment, his right lung infiltrate progressed, hypoxemia ensued, and intubation with mechanical ventilation was necessary. Bronchoscopy revealed hem-

orrhagic and friable airways with thick mucous; HSV type 1 was cultured from the washings. Acyclovir was begun and the patient quickly improved and was extubated 8 days later.

These two cases demonstrate that HSV pneumonia can occur in immunocompetent hosts. Since HSV pneumonia is curable, physicians need to consider this virus in their patients with pneumonias that are refractory to standard antibiotic therapy.

11. Evolution of an Endemic Nosocomial Plasmid with Multi-Resistance Genes.

H. Jiang, MD, J. Zieg, PhD, A.A. Medeiros, MD, T.F. O'Brien, MD.

The effectiveness of an antibiotic begins to diminish when a new gene expressing resistance to it evolves in a strain of a previously susceptible bacterial species and declines further when the gene begins to recombine into other genomes, especially those on a transferable plasmid.

Strains of *K. pneumoniae* were collected from various clinical specimens. Disc diffusion method was employed as susceptibility testing. Plasmid DNAs were extracted and analyzed by endonuclease digests and electrophoresis. Beta-lactamases were studied by isoelectric focusing. Dideoxynucleotide chain-termination reaction was used on DNA sequencing.

Strains of *K. pneumoniae* resistant to ceftazidime (CAZ) began to emerge at one medical center in December 1988, first repeated from one burn patient and then from 30 other patients over 2 years. Six available isolates carried a new beta-lactamase, TEM-12, which hydrolyzed CAZ but not other third-generation cephalosporins. In 3 of those isolates TEM-12 was encoded on transferable plasmids, which were nearly identical to pLST1000, a plasmid found in the same center and many other hospitals in the US and South America almost 15 years ago and carried TEM-1 enzyme that hydrolyzed ampicillin but not CAZ. Sequencing of these plasmids showed TEM-12 differed from TEM-1 by a single nucleotide mutation, and it was on the exact locus as TEM-1 on pEST1000, which was a functional transposon Tn2. However none of those isolates were resistant to amikacin (AMK). In 1991 a blood isolate was obtained with resistances to both CAZ and AMK. The plasmid encoding the resistances was again a derivative of pLST1000 but acquired an additional fragment that harbored the aminoglycoside-modifying enzyme *gone aacC* by homologous recombination. An endemic plasmid expressing CAZ-resistance originated from a point mutation within a functional transposon on a previous widespread plasmid

and disseminated in part by being transposed repeatedly to other plasmids, then acquired AMK-resistance by recombination. Such linkage of rare resistance genes may be pivotal for resistance spread and early detection and containment of such event could preserve the effectiveness of newer antimicrobial agents.

12. Splenomegaly in Women With HIV Infection: A Retrospective Review.

Robert M. Dean, MD, Charles C.J. Carpenter, MD, Fred J. Schiffman, MD, Edward Feller, MD, Douglas DeOrchis, MD.

Splenomegaly, although uncommon in the healthy population, is frequently observed in patients with HIV infection. The purpose of this study was to determine the prevalence of splenomegaly in a large population of women with HIV.

We retrospectively reviewed 225 women who were HIV positive, documented palpable spleens by physical exam, and correlated this finding with simultaneously obtained CD4 counts. When available, CT scans were reviewed and splenic sizes were calculated using volumetric measurements. These CT scans were obtained to image other abdominal processes in patients with and without palpable spleens.

We found that 32% of patients had palpable spleens ranging from 1cm to 7cm below the left costal margin. The average splenic volume was 1272cm³, and ranged from 52.8cm³ to 2880cm³ (the upper normal limit is 480cm³). The mean CD4 count in patients with palpable spleens was 350 cells/mm³. Greater than 90% of the 24 CT scans demonstrated splenomegaly. We will analyze the relationship between the largest spleens found on CT scan to those in patients with splenomegaly on physical exam.

Splenomegaly is a common finding in patients with HIV. The presence of an enlarged spleen may result either from HIV infection or from opportunistic infections or neoplasms. Physical examination revealed splenomegaly in 32% of patients, and abdominal CT scans suggested an even higher prevalence of splenomegaly in HIV-infected women.

13. Prospective, Multicenter, Open-Label, Nonrandomized Trial of Paromomycin For Cryptosporidiosis in AIDS.

Bharat Ramratnam, TP Flanigan, C Graeber, J Hellinger, D Smith, J. Turner.

To evaluate the efficacy of paromomycin in AIDS-related cryptosporidiosis, 39 patients with AIDS (mean CD4=41, range=0-175) with cryptosporidiosis confirmed by modified acid fast staining were enrolled in an open, nonrandomized, prospective trial of paromomycin 500 mg po qid for 28 days.

Pre-, intra-, and post-treatment patient weights, stool frequency, stool exam for oocysts and use of antidiarrheals were used to characterize treatment efficacy.

Of 39 patients enrolled, 36 completed 2 weeks and 26 completed 4 weeks of therapy. Reasons for discontinuing therapy included development of intercurrent illness (8), lost to follow-up (2), intolerance (1), noncompliance (1) and no response (1). At 4 weeks, 18 of 39 (46%) had increased weight (mean increase=3.2kg) and 19 of 39 (49%) had resolved or improved diarrhea. There were 15 clinical responses (weight gain, resolved or improved diarrhea with no or decreased use of antidiarrheals), 10 partial responses (improved diarrhea with decreased or no change in weight) and 1 no response (worse diarrhea, weight loss). Stool examination for oocysts of patients who completed 4 weeks of therapy was negative in 13 of 26 (50%), positive in 7 of 26 (27%) and not done in 6 of 26 (23%).

Paromomycin is effective in controlling diarrhea and increasing weight in approximately 50% of patients with AIDS with cryptosporidiosis. Paromomycin is well tolerated and should be the initial treatment for cryptosporidiosis in AIDS.

14. Retrospective Chart Review of Gastrointestinal Hemorrhage and Therapeutic Endoscopy.

C.L. Dibble, DO, Charis Meng and Alan Epstein, MD.

Upper GI hemorrhage remains a significant cause of mortality each year worldwide. Non-variceal bleeding secondary to peptic ulcer disease is the most common cause of upper GI hemorrhage. The use of therapeutic endoscopy with interventional thermocoagulation and injectate therapy remain promising but mortality remains constant at 6% to 10%. We describe the initial results of a retrospective chart review including 64 consecutive admission within the Brown Hospital system for non-variceal upper gastrointestinal hemorrhage. Inclusion criteria were evidence of active bleeding and the performance of upper endoscopy. Patients with a known history of a bleeding diathesis, GI tract malignancy, or metastatic disease were excluded. Predetermined end-points included permanent hemostasis or evidence of rebleeding (new hematemesis, melena, or decrease in Hgb>2gm) necessity for surgery, or 30-day mortality. A preliminary look at 64 charts, of which 13 had therapeutic intervention with thermocoagulation or epinephrine injection, 4 patients had complications such as repeated hematemesis or necessity for surgery, 3 of these patients died.

These initial descriptive statistics interest us

and we hope to look at an additional 200 charts to reach more meaningful statistical conclusions. Additionally, the question of which modality of intervention may be associated with improved outcome will be evaluated.

15. To Transfuse or Refuse.

Athena Stoupis, MD, and Philip O'Dowd, MD.

Housestaff often are urged to prophylactically transfuse if the H/H is below an arbitrary number. 10/30 seems to be the level at which both surgical and medical attendings anticipate problems with certain elderly or post-op patients. The Transfusion Review Committee at Roger Williams Medical Center regards 8.5/25 as an acceptable indication for transfusion in any case. Indeed, the practice of transfusing for numbers approaches a standard in the community.

Anemic Jehovah Witness patients provide an opportunity to observe clinical outcomes when transfusion is not an option. We capsule three recent patients who endured severe anemias without transfusion.

Case 1: A post-op Hgb=3.9 was reported for a 77-year-old Jehovah Witness with metastatic breast cancer and a pathologic hip fracture requiring surgical repair. She experienced angina and showed EKG changes. Therapy was with Epogen, IV iron, vitamins, nutrition, limited phlebotomy, O₂, strict rest and anti-anginals. She was asymptomatic and discharged 3 weeks later with a Hgb=7.9.

Case 2: An 85-year-old Jehovah Witness with progressive dyspnea x 2 months was noted to have a Hgb=2.9 (MCV=64). Lab confirmed iron deficiency. Chest pressure and EKG changes were present. Therapy was with Interferon, O₂ and rest. Epogen was not given since her intrinsic erythropoietin level was 2300 (5-25=nl). She was discharged to home with close physician follow up when her Hgb=3.8. After 3 uneventful weeks her Hgb was >8 and rising.

Case 3: A post op Hgb=6.5 was noted in a 53-year-old Jehovah Witness s/p multiple surgeries related to signet cell cancer. Symptoms of dyspnea and tachycardia were present. She was treated with Interferon, O₂, limited activity and vitamins and by discharge 2 weeks later her Hgb had risen to 9.4.

Patients with symptomatic, severe anemias may repair the anemia if they possess the necessary substrate. If Epogen production or marrow response is limited for other reasons (renal failure, mets, radiation, chemo, inflammation, ...) there may be benefit to exogenous Epogen. Certainly these three cases suggest that physicians might be more transfusion-tolerant of reversible anemias, especially in

asymptomatic patients.

16. Neurosarcoidosis Presenting as Impotence.

M. Swift, MD, and R. Appenfeller, MD.

JM is a 22-year-old white male who presented with complaints of impotence, progressive fatigue, weight gain of 55 pounds and paresthesia of the upper and lower extremities of 6 months' duration. His medical history was significant only for recent root canal surgery. He took no medications. A review of systems revealed urinary frequency but was otherwise negative.

On physical exam, the patient was an overweight normotensive, healthy-appearing male. He had neither moon facies nor a buffalo hump. There were striae in the anterior pectoral region, mild gynecomastia, small testicles bilaterally, diffuse hyporeflexia and slight calf tenderness. The lung exam was unremarkable. Initial labs included FBS 92, CPK 673 (100% MM), aldolase 9 (H) and ESR 6. CBC and Chem 24 were otherwise normal. An AM cortisol and dexamethasone challenge were normal.

As the patient continued to complain of paresthesia, EMG and NCV were performed, which disclosed a mild sensorimotor peripheral polyneuropathy. As his history and physical pointed to androgen deficiency or estrogen excess, a testosterone level was ordered, and free testosterone was undetectable (<0.1). Serum FSH and LH were essentially absent (both <5). This pointed to pituitary or hypothalamic pathology to explain both the hypogonadism and the weight gain (via a hypothalamic eating disorder). An MRI of the brain was obtained and revealed and enhancing suprasellar mass invading the chiasm. Visual field testing confirmed a subtle bitemporal deficit. A CXR demonstrated bilateral hilar and mediastinal adenopathy, suggesting sarcoidosis as a unifying diagnosis. A sural nerve biopsy showed a single granuloma, while a muscle biopsy revealed multiple non-caseating granulomata with giant cells, consistent with the diagnosis of sarcoidosis. Therapy with prednisone was initiated, and a subsequent MRI revealed resolution of the mass.

The protean manifestations of sarcoidosis continue to challenge the clinician. This unusual case serves as a reminder to consider neurosarcoidosis as a treatable etiology of seemingly unrelated neurologic and neuroendocrinology findings.

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If I Were Dean . . . : Thoughts Offered by Two Graduating Medical Students

Two senior medical students, MD Class of 1994, were each asked to submit brief essays on the suggested theme, "If I Were Dean . . ." The two students—now graduated as physicians and involved in their residencies—were given wide latitude in what they wished to write about.

Dr Monica Shah is now in the first year of her internal medicine residency at Johns Hopkins Hospital, Baltimore MD. Dr Liza Donlon is also in her first year of residency in psychiatry in the Harvard-Longwood Ave program, Harvard Medical School.

First Impressions

Monica Ravindra Shah, MD

Perhaps the most wonderful thing about being a medical student is that everything is a new experience—a package waiting to be unwrapped. One month you eagerly deliver a squirming infant, awed and petrified by the new life wriggling in your arms. The next month you are studying pediatric diseases, struggling to answer a little boy's question about why his eyes have turned yellow. You slowly learn to deal with death and dying, and you begin to understand the courage it takes to fight a disease and live. If I were Dean, I would encourage medical students to treasure their first impressions, for our early experiences are the compasses that guide us as we plunge forward in medicine.

When I think about who my role models are and why they have influenced me so deeply, a common theme emerges. These

physicians still approach their craft with a sense of discovery and passion. Despite years of experience on the wards, they delight in simple cases as well as difficult diagnoses. They are still moved by death and disease. They have not forgotten the wonder of their clerkship years, the importance of compassion, the thrill of becoming a doctor.

As clinical clerks, we are confronted with many thorny issues—scientific, social, ethical—often for the first time in our lives. We learn to admire patients who battle against disease, and we also learn to reserve judgment against those who simply cannot accept their diagnosis. As students, we observe, first hand, the inequities of medicine, the problems of imposing values and traditions, and the limitations of our future craft. We also see the power of med-

Medical school is not easy, and the clerkship experience can magnify any student's sense of inadequacy.

icine, the gratitude of patients, and the resiliency of the human spirit. It is our first impressions of these complex issues, that I believe, prepare us for the difficult decisions that, one day, we will be called to make.

Medical school is not easy, and the clerkship experience can magnify any student's sense of inadequacy. We are initiates to a culture with a long history of tradition—both glorious and painful. The hospital environment is fraught with puzzles that would take any medical student years to unravel. But with each obstacle comes a challenge, an opportunity to grow and explore that few people have the privilege to experience. The memories of our first ventures onto the wards are essential, for they help us stay focused on what medicine is truly about—patients and their health.

The Affinity Group: My Entrance Into the World of Clinical Medicine

Liza Donlon, MD

With the increase in political and financial pressures on medicine, medical schools seem more interested than ever before in shaping curriculum to meet the demands of the marketplace. As part of a recent survey of seniors in medical school by the American Association of Medical Colleges, I was asked if I felt my program provided adequate exposure in various areas including: basic sciences, clinical sciences, diagnostic skills, ethics, and the role of medicine in the community. I was also asked many questions on the factors contributing to my choice

of specialty. The survey would be used, it said, to "set national priorities," "develop programs and policies," "move the profession closer to its goals," and for "research on education and health manpower policy questions."

I am happy to report that by the questionnaire's standards my school did very well. Completing the survey gave me a chance to review my 4 years and, on the whole, I am pleased with the medical education I received at Brown. My experiences in the classroom and in the clinics, for the most

. . . medical school should be the time for students to acquire the essential and timeless skills of medicine, skills which aren't lost or less useful when there is managed competition, budget cutting, and tight insurance regulation.

part, have been of good quality and exciting. In terms of emphasizing disciplines important to the future of medicine (as best as any of us can guess what that is) I believe Brown is doing its job.

While I believe health care reform is long overdue and its emphasis on primary care sensible and important, I believe that residency, or even the early years of practice, are better times for shaping education based on the marketplace. Rather, medical

school should be the time for students to acquire the essential and timeless skills of medicine, skills that aren't lost or less useful when there is managed competition, budget cutting, and tight insurance regulation. The role of school administrators should be to identify those basic skills and make sure they are learned.

Beside basic clinical knowledge and the physical exam, the two skills I have valued most in all my rotations that are not addressed so well by the AAMC survey are: 1) the ability to analyze and solve a problem, to formulate diagnoses or hypotheses, to know how to look for the best resources, and to work cooperatively; and 2) the ability to empathize with one's patients. Without analytic skills a physician is an automaton—working by formulae. And without empathic ability a doctor is a technician—and one who is baffled and often frustrated by his patients.

In contemplating my 4 years at Brown, I believe that it was my Affinity Group—an adjunctive part of the Brown curriculum—that provided the richest experience in acquiring these critical doctoring skills. I would like to present the experience of my group as an example of an alternative learning environment existing at Brown in which I was able to use and learn these abilities.

The Affinity Groups at Brown are made up of a number of students—usually about 8—who share a common interest in some topic related to medicine, such as international health or women's health. My chosen group was in literature and medicine, and to fulfill the only requirement Brown made of the group we met regularly—first every 2 weeks, then weekly. Depending upon the degree of interest in the group, the activity ranged from meeting just to have dinner and talk, to undertaking projects such as assessing health care needs in under-served minority communities.

My group was among the most enthusiastic and active, perhaps because of the skills of our preceptor. Yet, it had taken some time for the group to get started. For several months we met weekly: eating dinner, discussing the week's school work or anxiety, and perhaps reading a short story or essay, and inevitably discussing what direction we as a group wanted to take. What emerged was a system in which one of the students was responsible for a block of time, either one or several meetings, and planned a project. We defined the goal of our group as the investigation of "experience" an absurdly vague topic but one which, in fact, served us well. During the 2 years the group met we read and analyzed *Borrowed Time*, a memoir about AIDS, and

read a work on abuse and its psychological effects by a woman who had been abused as a child. We discussed race and gender in art, literature, and medicine. We wrote fiction about our experience in anatomy laboratory or about the lives of those who had given their bodies for our education. We wrote about our first experiences on the wards—experiences that were often confidence-shaking. We met an HIV-positive man who had just suffered his first opportunistic infection. We talked with him, free to ask questions since he had agreed to talk with us, and we wrote fiction related to the visit or his life. We read these works to each other, not so much to critique but to hear the variety of interpretations even within this small group. The success of this group was due partly to chemistry, luck, and timing; but also, I think, to what it provided that medical school did not.

Our Affinity Group's organization differed from the rest of our curriculum in that we were initially led by a preceptor and later meetings depended upon student direction, input, and interaction. Although the group met faithfully even in the beginning, it became most interesting and productive once we had ourselves chosen a direction and were individually responsible for the quality of the sessions. The enthusiasm generated and lessons learned in this group carried beyond the bounds of our meetings into our other courses and rotations.

In contrast to this, the onslaught of information in traditional medical education and the student's role in learning was once described by a friend as being like "standing under a garbage truck which is unloading information on you and you just want to still be standing when it finishes." Learning through memorization of formal lecture may

be required to establish a foundation of knowledge, but beyond that only allows a student to survive medical school and doesn't serve that student well beyond academia.

Another aspect of my Affinity Group that has continually proven useful and enriching, and which I believe is critical for all physicians, was its emphasis on understanding the experience of others. In reading and writing about the lives we imagined our patients had, and that our cadavers had had, we reminded ourselves of the human life behind the body and organ systems we were examining. As all of us progress in medical education we become further removed from our patients—inured to cries of pain by the number of times we have heard them, irritated by the demands of so many needy patients. And yet, to be able to decide how to give bad news, to understand why patients may jeopardize their health, and to find the patience to deal with someone we may find difficult, it can be invaluable to try to understand our patient's life and recognize why they may not conform to our expectations. I have heard that "empathy is not something you can teach," but regular attempts to understand life as a patient experiences it can be enlightening. It can provide a recognition that the patient had an identity before or apart from their illness, some understanding of the fear that accompanies illness, understanding of the patients wishes and expectations, and insight into how a physician's actions and words may be perceived.

That Brown has recognized the potential for learning experiences outside the classroom and instituted the Affinity Group programs is forward-thinking and unusual. And Brown, unlike any other medical school I

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know, does allow and even encourages students to learn more actively and to form their own group study courses. For several years at the medical school students who felt they could learn pharmacology better independently formed small student-led groups with clinical specialist lecturers—in lieu of the usual required course taught by lecture. But because of the work involved in designing a course, there is a limit to the amount of student self-directed learning of this kind which is feasible.

The administration at Brown has stated that it is working toward increasing the number of courses taught by problem-based learning, an interactive technique that provides students with a problem or clinical case to solve. The students start by applying what knowledge they have and determining what more they need to know to solve the problem. Groups work together and individuals do research on specific questions. Most students have agreed, I think, that the well-taught problem-based courses we have had are far superior to almost any lecture. They are more interesting, more challenging, and by demanding input from the student are more rewarding. Unfortunately, perhaps because planning these teaching cases is more time-intensive, the problem-based courses and courses demanding student involvement are still in the minority at Brown.

The curriculum at Brown does attempt to provide some exercises in gaining empathic insight in the first year psychiatry class when each student meets several times with a patient at his or her home. From the knowledge of the medical history, home, and family gathered in these meetings the student writes a *Biography of a Person with*

an Illness. A valuable experience, this is unfortunately too isolated an attempt to encourage students to attempt actively to understand their patients.

Brown clearly has taken steps to ensure that its students are trained to be thinking and compassionate physicians and, from what I have heard about other students' experiences, does a far better job at this than most medical schools. It has embraced, if not fully instituted, the problem-based learning format that promotes active, interactive, and cooperative learning—and is a far better model for the continued learning required in the practice of medicine than is the traditional lecture-only method.

The Brown curriculum also makes some efforts to require exercises in empathy. But these are given far too little time in the curriculum. As students rush off to residency and careers in which they will need to continuously re-educate themselves on developments in medicine, they may never

have the time or be able to imagine the life of the patient they are examining.

With its existing strengths in the development of a progressive curriculum, I hope that the Brown administration will continue its efforts to expand the kind of learning provided by experiences like the Affinity Group, and I hope that other medical schools will initiate such programs.

The pressures of the marketplace will exert themselves through job opportunities and should not exert too much influence in medical school. The job of all administrations I think, is to function not so much as a training program turning out "X" number of researchers, specialists, or primary care physicians but to ensure that all of its students have, in addition to basic clinical skills and knowledge, the abilities necessary to continue to find medicine rewarding—the ability to keep learning alone and cooperatively and the capacity to feel for and be inspired by our patients.

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Rhode Island **MEDICINE** **Urinary** **Incontinence**

Guest Editors:
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Practicing Physicians of RI: Women Physicians

Nikki Deary, Milton Hamolsky, MD,
and Stanley M. Aronson, MD

... during the 3 preceding years (1990-1993) there have been more women physicians entering practice in Rhode Island than in all the 75 years extending from 1895 to 1970.

Title 5, Chapter 37 of the laws of Rhode Island (1986), defined and established the Rhode Island Board of Medical Licensure and Discipline. This board, the membership of which is selected by the governor, is composed of four licensed allopathic physicians, two licensed osteopathic physicians, five public members, one hospital administrator and is chaired by the director of the Rhode Island Department of Health.

In fulfillment of its many assigned duties, the board also accumulates public information on the demographic and educational characteristics of the physicians licensed to practice medicine in Rhode Island. As more of this compiled public information is stored in a computerized database, summary descriptions and analyses of trends shall be published periodically in professional journals such as *RHODE ISLAND MEDICINE*.

This report summarizes information, current and historic, on women physicians who have held or are currently holding license to practice medicine in this state. Specific data have been extracted from various sources including the sample of all physicians newly licensed by Rhode Island in the year 1992 (the latest to be fully entered and available in the board's data base), and for general comparison, the American Medical Association's 1990 text, *Physician Characteristics and Distribution in the US*.¹

Number of Women Physicians in Rhode Island

Rhode Island began to issue licenses expressly permitting the practice of medicine during the last decade of the 19th century. In the 99 years since this regulation had been adopted, the state has granted 8034 medical licenses of which 987 (12.3%) were issued to women physicians. Table 1 summarizes the numbers of authorized

Rhode Island medical licenses, segregated by gender, and divided into successive 5-year intervals.

During 1895-1899, relatively large numbers of licenses were allocated as previously unsanctioned practitioners hastened to comply with the new regulatory legislation. From the turn of the current century to 1924, there was a gradual reduction in the number and percent of licenses issued to women. Indeed, on average during this interval, only one license per year was record-

ed for women physicians, and in the years between 1920 and 1924, no new licenses were granted to them. The administrative records for those years do not indicate whether any women had even applied for medical licensure. The numbers of women certified to practice then rose modestly during the succeeding three decades (1924-1954) but never exceeded 10% for any 1 year. In the 1940-1944 interval, the percent of licenses assigned to women physicians rose to 9.3% reflecting, not a rise in the number of wom-

Table 1. — Licensed Women Physicians of the State of Rhode Island

Interval*	Total Number Licenses Granted	Number of Women's Licenses	Average Number Per Year	Average # Female Licenses/Yr	% Female Licenses
1895 - 99	830	46	166	9.2	5.5%
1900 - 04	287	12	57	2.4	4.2
1905 - 09	195	5	39	1.0	2.7
1910 - 14	151	5	30	1.0	3.3
1915 - 19	110	3	22	0.6	2.7
1920 - 24	140	0	28	0	0.0
1925 - 29	169	8	34	1.6	4.7
1930 - 34	248	13	50	2.6	5.2
1935 - 39	232	11	46	2.2	4.7
1940 - 44	140	13	28	2.6	9.3
1945 - 49	231	8	46	1.6	3.5
1950 - 54	259	11	52	2.2	4.2
1955 - 59	353	34	71	6.8	9.6
1960 - 64	298	18	60	3.6	6.0
1965 - 69	422	23	84	4.6	5.5
1970 - 74	655	69	131	13.8	10.5
1975 - 79	764	94	153	18.8	12.3
1980 - 84	593	110	119	22.0	18.5
1985 - 89	1013	245	203	49.0	24.2
1990 - 93	944	259	236	64.8	27.4
Totals	8034	987			12.3%

* Each interval is 5 years except 1990 - 93, which is 4 years.

Table 2.—Licensed Women Physicians in New England States As Percent of All Practicing Physicians*

State	Below Age 35 yrs	Ages 35 to 64	Age 65 or more	All Ages
Massachusetts	32.9%	18.0%	8.4%	20.8%
Connecticut	29.3	14.6	8.0	17.2
Rhode Island	32.6	14.8	7.3	18.2
Vermont	28.0	15.7	7.6	16.9
Maine	29.4	11.6	7.7	13.6
New Hampshire	25.0	12.7	8.6	13.1
All New England	31.3%	16.0%	8.1%	18.6%

* Modified from, *Physician Characteristics and Distribution in the US* (American Medical Association, 1990) representing data on 40,582 registered physicians in New England as of 1990.

Nikki Deary is deputy chief administrative officer of the Rhode Island Board of Medical Licensure, Dr Hamolsky is chief administrative officer of the board and professor emeritus, Brown University School of Medicine, and Dr. Aronson is a member of the board and dean of medicine emeritus, Brown University School of Medicine.

Table 3.—Medical Schools Attended By Physicians Recently Licensed by the State of Rhode Island (1992)

Location of Medical School	Male Physicians	Female Physicians
New England states	26.9%	37.1%
Atlantic states	27.7	25.7
Southern states	10.8	14.3
U.S., other	14.7	11.4
Canada	1.5	1.4
Caribbean, Latin America	5.4	2.9
Asia, Africa	9.2	5.7
Europe	3.8	1.5

en granted licenses, but rather a substantial *reduction* in the number of male physicians accorded licenses (dropping to about 28 new licenses per year compared with 48 per year during the preceding decade.) It is likely that many male medical graduates in the 1940-1944 interval entered the armed services directly without obtaining civilian licenses. No dramatic increases in the numbers or percentages of newly licensed women physicians are evident in the two decades following World War II. A substantial increase, however, becomes apparent in the years following 1970. This rise has been uninterrupted and progressive, reaching 27.4% by 1990-1993. In this century of recorded Rhode Island medical licensure, over half of the 987 women physicians who have ever held a license in this state received their licenses since 1985. Expressing this observation differently, during the preceding 3 years (1990-1993) there have been more women physicians entering practice in Rhode Island than in all the 75 years extending from 1895 to 1970.

Women Physicians in New England

Table 1 provides data on the percent of *newly licensed* physicians who are women. Table 2, on the other hand, indicates the percent of *all* practitioners—newly licensed or not—who are women. In epidemiologic terms, Table 1 offers the *rates* of entrance to the practice of medicine by year, while Table 2 provides the *prevalence* of women physicians.

The three southern tier New England states (Connecticut, Rhode Island, Massachusetts) have a larger proportion of women physicians than do the three northern tier states (Vermont, New Hampshire, Maine), particularly in the category of physicians 35 years of age or younger (Table 2).

In Rhode Island, 32.6% of all licensed physicians 34 years of age or younger, are female. Between ages 35 and 64, this drops to 14.8%. And among Rhode Island physicians older than 65 years, the fraction drops still further to 7.3%.

Medical Schools Attended by Women Physicians

A previous study² had summarized the medical schools attended by all 2,747 currently licensed physicians in Rhode Island but did not provide any breakdown by gender. Table 3 is based primarily on information concerning newly licensed physicians in Rhode Island for the year 1992 only. An increasing proportion of this cohort of physicians, male and female, had been educated in United States medical schools. This trend is particularly evident with younger women physicians entering practice in Rhode Island. Thus, among the total physician pool in Rhode Island—recent as well as old licensees—31.5% attended foreign medical schools.²

Among newly licensed male physicians, for the year 1992, this fraction is down to 18.4% and among female physicians, it is reduced still further to 10.0%. Table 3 also illustrates that the medical schools attended by newly licensed male physicians are more geographically dispersed than the schools that had been attended by their female medical colleagues. Among women Rhode Island physicians, for example, 37.1% attended the local New England medical schools. Among male physicians, the fraction was 26.9%.

The Age of Newly Licensed Physicians

A prior study of the Rhode Island physician population had revealed that the average male physician was 48.7 years of age, while the average age of the female physicians was 43.1 years.²

Table 4.—Women Physicians in the United States (as of 1989): Choice of Specialty Expressed as Rank*

Specialty	Age Groups					RI Women MDs
	Under 35	35-44	45-54	55-64	65+	
Int. medicine	1	1	2	4	4	1
Pediatrics	2	2	1	2	3	2
Family medicine	3	3	4	3	2	3
Obstet/Gynecol	4	5	6	6	6	4
Psychiatry	5	4	3	1	1	5
Anesthesiology	6	6	5	5	5	(Pathol.) **

* Columns 1-5 derived from *Physician Characteristics and Distribution in the US* (American Medical Association, 1990). Column 6 (RI Women MDs) represents the declared specialties of the 70 women receiving newly issued licenses to practice medicine in the state of Rhode Island, 1992.

** Pathology was the sixth most commonly chosen specialty in this group; anesthesiology was in seventh rank.

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Using data from the 1992 cadre of newly licensed physicians in Rhode Island, a similar age discrepancy emerges. The average age of the newly licensed male physician is 36.7 years, and for the female physicians, 34.2 years. Among newly licensed male physicians, 24.4% were older than 40 years (at the time of applying for licensure), while among female physicians, only 12.9% were older than 40 years.

Specialties Chosen by Men and Women Physicians

Table 4 summarizes, by rank, the medical specialties currently selected by women physicians, both in Rhode Island and the United States. Licensed women physicians older than 55 years cluster their professional activities essentially in the fields of psychiatry, pediatrics and family (general) practice. Among younger women physicians this pattern has been supplanted by internal medicine (now the first choice of younger physicians, male or female) and, to a lesser degree, by obstetrics and gynecology. Psychiatry, the first choice of women physicians older than 55 years, is now relegated to fifth rank. Notice that the career choices of Rhode Island women physicians (as exemplified by those newly licensed in 1992)

Table 5.—Percent Board Certification, by Selected Specialty and Gender as of 1990*

Specialty	Percent Certified	
	Male	Female
Anesthesiology	53.3%	42.1%
Family Practice	50.7	48.3
Internal Medicine	56.4	43.0
Obstetrics, Gynecology	67.7	36.2
Pathology	79.9	64.9
Pediatrics	66.8	48.9
Psychiatry	54.5	34.2
All Specialties	60.1%	43.6%

* Modified from *Physician Characteristics and Distribution in the US* (American Medical Association, 1990)

are virtually identical to the ranked choices of US women physicians 35 years of age or younger.¹

Table 5, based on nationally derived data,¹ shows that 43.6% of women physicians and 60.1% of male physicians are certified by at least one specialty board. This table also provides the percent certified nationally, male and female, in the seven medical specialties historically chosen by women.

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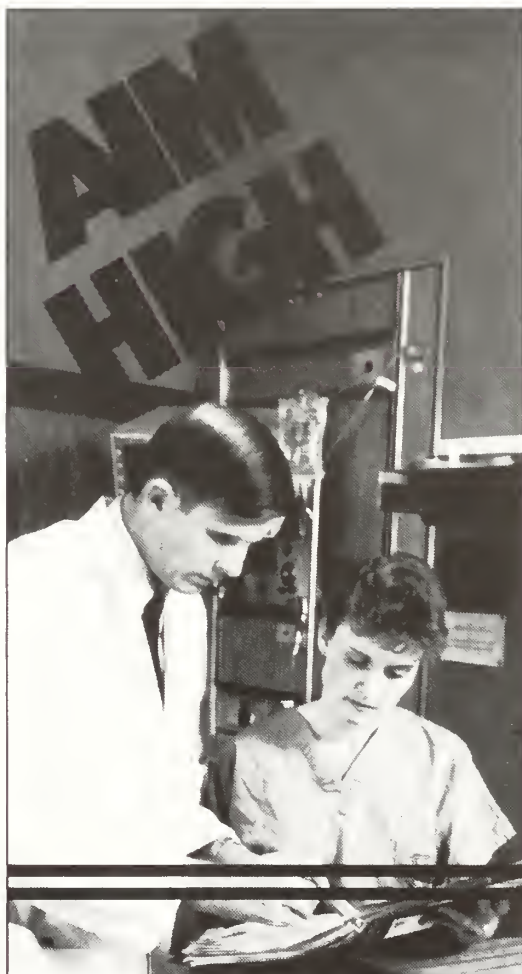
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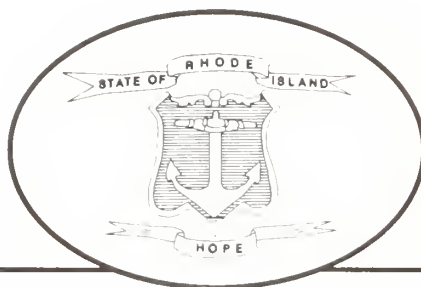
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Chief, Office of Health Statistics

Black-White Differentials in Health Status

In *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*,¹ three overarching goals are presented as fundamental to all of the specific health objectives in that report:

- Increase the span of healthy life for all Americans
- Reduce health disparities among Americans
- Achieve access to preventive services for all Americans

The inclusion of the second goal, reducing disparities in health, is based on strategic considerations, in that an effective way to improve overall health is to focus on the least healthy members of our population, as well as considerations of fairness. Three groups were singled out as populations at especially high risk of poor health: people with low income, people with disabilities, and people in minority ethnic and racial groups.

In Rhode Island, periodic assessments of the health of the population have documented the disparities experienced by minority groups.² A recent analysis examined the health status of the state's major minority groups, based on the consensus set of National Health Status Indicators³ developed by the Centers for Disease Control and Prevention for use at the national, state, and local levels. The set includes indicators of mortality, morbidity, and health risks that are measurable in relatively small population groups. Presented here are the full set of indicators for the state's African-American, or black, and white, non-Hispanic, populations based on the most current data available.

As measured by 16 of the 18 indicators, African-Americans have worse health status and experience higher health risks than the white, non-Hispanic population. Among the measures of mortality (adjusted to a standard age distribution), rates for blacks are higher than those for whites for every cause of death examined except work-related injuries, for which there were no deaths

among blacks (Figure 1). Overall, black mortality is 80% higher than for whites, and by cause, the excess mortality experienced by African-Americans ranges from 25% for lung cancer to 833% for homicide.

The excess rates of morbidity experienced by African-Americans, as measured by incidence rates for selected reportable diseases, is even greater than the differentials found in mortality (Figure 2). The incidence rate for syphilis among blacks is 32 times the rate for whites. For tuberculosis and AIDS, reported incidence rates are over 8 times as high among blacks as among whites. For measles, the situation was reversed; no cases were reported among African-Americans during this period.

The pattern of disparity extends through the set of indicators related to health risk. (Figure 3) Black children are 5 times more likely to be poor, as defined by the federal

poverty level, than white children in Rhode Island. The percentage of newborns whose mothers are under age 18 is nearly 3 times as high among African-Americans as among whites. Additionally, black mothers are far less likely than white mothers to receive prenatal care during the first trimester of pregnancy and far more likely to have low birth weight babies.

This comparison of black and white experience in 18 key health measures is overwhelmingly one of disparity. In addition, the data reflect patterns that have been found in previous studies, both nationally¹ and in Rhode Island.² Because of their breadth and persistence, these disparities represent a major challenge in the achievement of the state's health objectives for the year 2000, and their reduction is integral to the implementation efforts of Healthy Rhode Islanders 2000.⁴

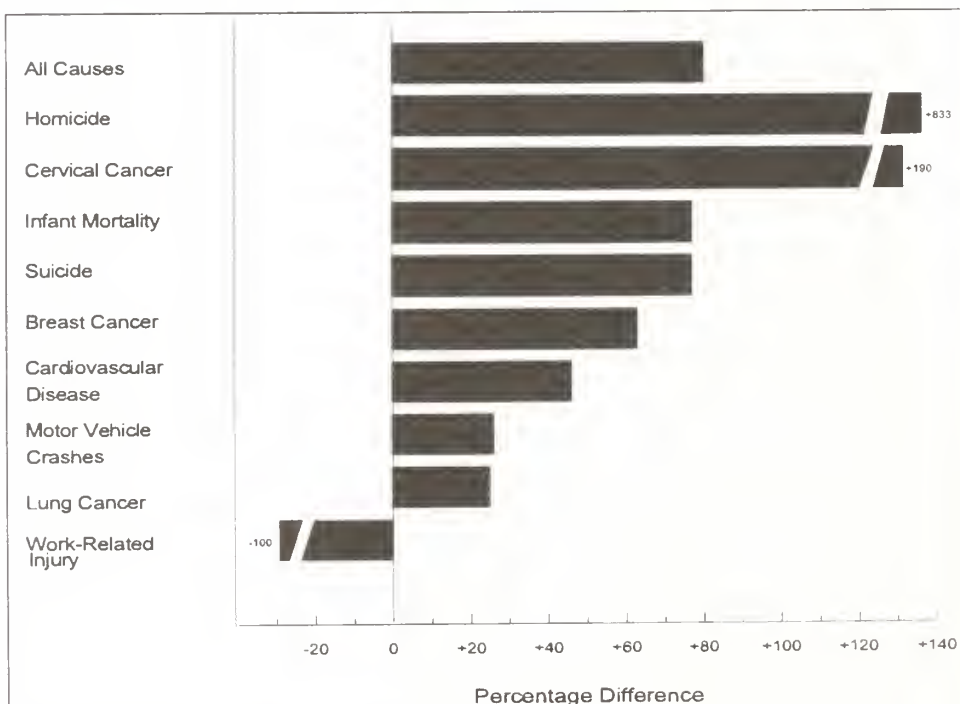


Fig 1.—Percentage difference in black mortality rate relative to white mortality rate, by selected causes of death, 1989-91 average.

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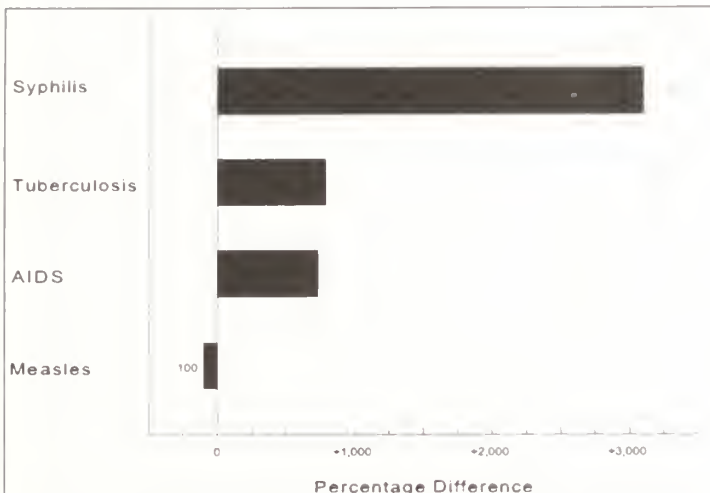


Fig 2.—Percentage difference in black incidence rate relative to white incidence rate, by selected reportable diseases, 1989-92 average (1989-1993 average for AIDS and syphilis).

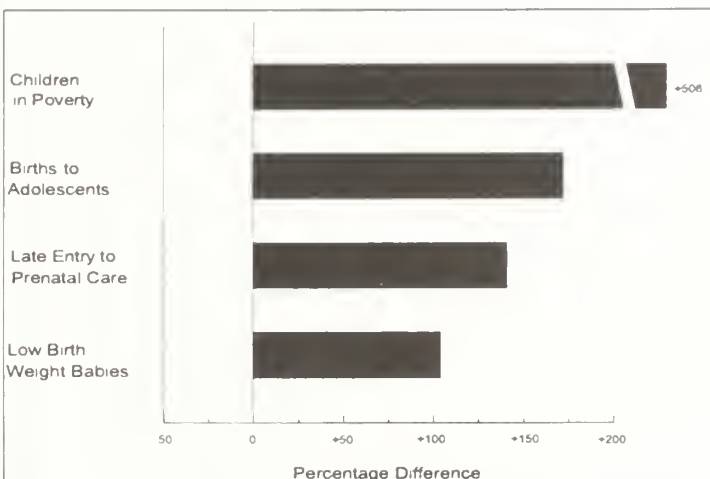


Fig 3.—Percentage difference in rate relative to white rate, selected health risk measures, 1989-91 average 1990 for children in poverty).

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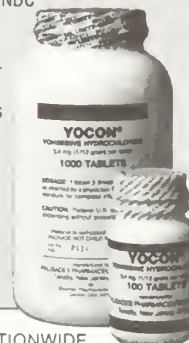
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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (July 1904)

The lead editorial discusses Rhode Island's excellent representation at the recently concluded American Medical Association annual meeting at Atlantic City. "Several prominent medical men from abroad were present and were received with almost enthusiasm although the tendency of the American press to exaggerate their importance and the value of their work was quite strongly marked. Newspaper notoriety counts but little," continues the editorial, "and it is not always the best paper which receives the most notice."

A second editorial decries the excessive, and needless, injuries incurred while celebrating the Fourth of July. The American Medical Association noted that, in 1903, there were 406 deaths from tetanus alone—all of these due to the use of blank cartridges. "If love of country is measured by the use of perilous explosives and ear-splitting, nerve-shattering, fulminating noises—we are certainly patriotic. In its altruistic mission the medical profession must protect thoughtless people against themselves." At the meeting of the Providence Medical Association, on May 2, 1904, it was unanimously voted that a committee see the proper authorities with the purpose of prohibiting the sale of the blank cartridge, inasmuch as it is far and away the most frequent cause of the cases of traumatic tetanus following in the wake of the accidents of the "Fourth."

William R. White, MD, presents a paper discussing some phases of medical sociology and the role of the responsible physician. This reflective essay touches upon the various ways in which social forces impinge upon the health and development of the human. The author notes: "A growing opportunity for the medical man to do good is among our increasing population of foreign birth and language, that is becoming more and more an important element in cities.

The doctor is apt to be one of the first to make the acquaintance and gain the confidence of these people, and it lies in his power to render them a great service especially in the matter of caring for their children under conditions that are strange to them. These people, Scandinavians, Italians and Jews, are here to stay and the problem is to Americanize them." The author also declares: "In his relation to the great question of temperance, in its individual and social bearing, the physician is usually conservative. No man knows better than he the terrible physical and domestic disaster that follows the abuse of alcohol, and by his example and influence he works for temperance. His ideas and practice may not suit the extremists or so-called reformers, for he believes that temperance implies a reasonable self-control in all things—food, drugs, exercise, work and diversion, as well as in the use of alcohol." Dr White then discusses at length the grave impact of venereal disease, particularly the gonococcal infections, upon the lives of individuals and their innocent families. He urges his fellow physicians to play a role in suppress-

ing wantonness. The husband who infects his wife with the gonococcus, he contends, is far more cruel than the alcoholic husband who physically abuses his wife. The essay ends with the following quotation from Samuel Johnson: "The certainty that life cannot be long and the probability that it will be much shorter than nature allows, ought to awaken every man to the active prosecution of whatever he is desirous to perform. It is true that no diligence can ascertain success; death may intercept the swiftest career, but he who is cut off in the execution of an honest undertaking, has at least the honor of falling in his rank, and has fought the battle though he missed the victory."

Fifty Years Ago (July 1944)

J.B. Rice, MD, discusses the various aspects of malaria including the nature and biology of its vector, the human host, the malarial parasite, and the treatment of this disease. The author concludes: "Epidemiology and clinical manifestations of malaria vary widely throughout the world.

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These differences are due to variations in three principal factors." Differences in the nature and habits of the anopheline species including the fact that the mosquito must be susceptible to malarial infection; that it must bite the human readily; that its longevity must be sufficient to permit the full cycle of parasitic development within its body; and that the vector species must be present in sufficient numbers. Second, that variations in the degree of immunity possessed by the human inhabitants of different parts of the world influence the clinical manifestations of malaria. And third, that strains of malarial parasites have been isolated which differ in their response to antimalarial drugs and in the severity of their symptoms.

James R. Miller, MD, discusses advanced planning for medical care as well as problems in certifying disability and therapeutic procedures not considered to be covered in such insurance plans. Finally, the author discusses the state of Connecticut's approach to the problem.

Charles L. Farrell, MD, and Laurence A. Senseman, MD, describe a case of polyneuritis caused by chronic exposure to carbon tetrachloride. The patient was a 38-year-old enlisted man whose duties included the repeated cleaning of bomb-sights using sprays of carbon tetrachloride. When he was removed from his assigned task, hospitalized and treated with high doses of vitamin B, the neuropathy gradually disappeared.

The admissions policies of the Chapin Hospital are described. Admission is for "communicable diseases and psychopathic patients." Total fees for ward care are \$4.00 per day; for semiprivate care, \$5.00; and for private care, \$6.00. "Service charges must be paid one week in advance."

25 Years Ago (July 1969)

Open heart surgery by a simplified technique is described by John Yashar, MD, and James Y. Yasher, MD. The authors report on 25 consecutive patients subjected to open heart surgery with the use of a disposable bubble oxygenator primed with 5% dextrose and water under normothermic conditions. One patient died. Types of procedures included pulmonary valvulotomy, closure of septal defects, aortic valvulotomy, open commissurotomy and aortic or mitral valve replacements.

Robert C. Little, MD, discusses the importance of the first heart sound in cardiac diagnosis. The author observes: "The clinical art of auscultation requires practice, patience, and an understanding of the physiological mechanisms responsible for the acoustic phenomena of the heart. In this paper the first cardiac sound has been singled out for review, and the effect of various clinical conditions on its timing, intensity, and pitch have been summarized."

Mark L. Dyken, MD, outlines the basic principles of therapy, surgical and nonsurgical, in cerebral vascular disease.

Robert V. Lewis, MD, provides the readership with a rare opportunity to compare physical measurements (eg, height, weight, various body measurements) on the same individual at ages 22 and 94 years respectively. Most of these measurements, in this vigorous male, were essentially unchanged.

Flurandrenolone (a topical corticosteroid) tape therapy in the management of certain dermatological disorders is described by Francesco Ronchese, MD.

Information for Contributors

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Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

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3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases*, 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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Urinary Incontinence



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Cover: Ink drawing of his wife, Agnes, by Albrecht Dürer (1471–1528).

Incontinence: Defining the Problem

Urinary incontinence is defined as the involuntary, socially unacceptable loss of urine. This definition belies the fact that it is often perceived as being out of the patient's control while being the potential cause of much embarrassment. The purpose of these articles is to increase the physician understanding regarding incontinence and describe available therapies. Thus armed we may empower our patients to regain control of their urologic function. A review of the scope of this condition, and attempts to better define it, allow us a clearer understanding of the problem.

Defining Incontinence

Normal urinary storage and control are dependent on the proper function of the bladder and the urethra. The bladder should act as a low pressure reservoir for the storage of urine, while the urethra, in combination with the bladder outlet, should maintain a pressure greater than that of the bladder to prevent the egress of urine until normal voiding. When bladder pressure overcomes outlet and urethra pressure involuntarily, incontinence results. This can occur with various derangements in bladder and urethral function, which allow us to separate incontinence into three broad categories. As therapy for these different states can be vastly different, the distinction is more than semantic. It should also be understood that although there are different types of incontinence, a given patient may be afflicted with more than one type. The three types of incontinence are characterized as urge, stress, and overflow incontinence.

Urge Incontinence

Urge incontinence is urinary leakage accompanied by the uncontrolled desire to void. Patients often report the inability to make it to the bathroom in time to relieve themselves. Some are able to control their urine while supine or sitting, but are rendered incontinent when they attempt to

ambulate. It is perhaps their change of position that triggers the urge. Other events may initiate the uncontrolled loss of urine, such as change in temperature, running water, or intercourse. Uninhibited bladder contractions are believed to be part of the underlying pathology that cause elevations in bladder pressure. This pressure elevation, which may or may not be accompanied by relaxation of the bladder outlet, results in urine leakage. These bladder contractions often can be detected with urodynamic evaluation. In the neurologically impaired patient, this condition is termed bladder hyperreflexia, while in the patient without neurologic disease, it is termed bladder instability.

Stress Incontinence

Stress incontinence is the loss of urine caused by increases in abdominal pressure. Patients with stress incontinence typically give a history of brief episodic leakage with events such as coughing, sneezing, lifting, or getting up from a sitting or lying position. The continent mechanism of the bladder outlet is compromised and unable to compensate for the additional stress placed with elevations in bladder pressure with activity. In women, this may be due to alterations in bladder positioning or decompensation of the bladder outlet and urethra. In males, this is usually caused by injury secondary to trauma or prostate surgery.

Overflow Incontinence

The bladder's ability to accommodate urine at a low pressure is finite, and voiding normally occurs before reaching this endpoint. If voiding does not occur, than leakage will result when the bladder pressure exceeds that of the outlet and urethral pressure. This can occur if there is a deficit in bladder sensation or if the bladder is unable to contract properly. Patients may be able to void partially, but often with an effect of simply "topping off" their urine volume with each successive storage and void.

Epidemiology

Incontinence affects about 10 million Americans. For patients aged 15 to 64 years,



the prevalence ranges from 1.5% to 5% and in women, from 10% to 25%.¹ This increases with age, with a prevalence from 15% to 30% in noninstitutionalized patients over the age of 60, with women having twice the prevalence as men.² Among those institutionalized, the prevalence increases to 50% or higher.³ The annual direct cost of caring for incontinence is \$7 billion in the community and \$3.3 billion in nursing homes (1987 dollars).⁴

Given the extent and cost of incontinence, guidelines were developed for its evaluation and treatment by a multidisciplinary panel convened by the Agency for Health Care Policy and Research (AHCPR). Published in 1992, the *Clinical Practice Guideline* and the *Quick Reference Guide for Clinicians* include recommendations, algorithms, table and figure and pertinent references. Also available is *A Patient's Guide*, which is available in both English and Spanish. These can be ordered by calling the AHCPR Clearinghouse toll-free at 800-358-9295, or by writing to: Center for Research Dissemination and Liaison, AHCPR Clearinghouse, PO Box 8547, Silver Spring, MD 20907.

Summary

As this issue of RHODE ISLAND MEDICINE demonstrates, incontinence is felt within all segments of society. No practitioners are insulated from patients suffering from this condition. Often, the suffering is silent for many reasons. Patients may have been conditioned to believe that theirs is a situation that is best left alone, and one that they should accept. If they overcome this hurdle, then they must be willing to address the problem with their physicians. This is obviously assisted if the subject matter is broached by the caregiver rather than relying on the patient to come forth regarding a socially compromising matter. Therefore, physicians need to be aware of the problems of incontinence, familiar with the various modes of therapy, and willing to take on

these issues with their patients with compassion and understanding. In this way can we address the full needs of our patients regarding a problem long ignored but easily diagnosed and treatable.

Raul Ordorica, MD
Barry Stein, MD

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J. Marion Sims, Pioneer Urogynecologist

The question is asked: What is the ultimate purpose of medicine? To a young resident physician, the resolute answer is the saving of lives; to a mature practitioner, it is the hope that much of sickness can be prevented and the quality of life enhanced; and to a still older physician, it is the sincere wish that the dignity of infirm persons might be preserved. Each answer reflects, in some measure, the personal yearnings of the respondent. No single one of these responses, alone, embraces the moral assignment of medicine; the profession stands as an incomplete estate when it lacks any of these three elements.

This issue of RHODE ISLAND MEDICINE addresses the vexatious problem of chronic urinary incontinence, estimated to afflict more than 10 million Americans. While it is not regarded as a life-threatening condition, it nevertheless reduces the mobility, the socialization, even the capacity to enter the work place for those afflicted and who go untreated. We have as yet no nationally heralded foundations to combat this depressing and humiliating disability, which socially paralyzes so many persons.

The adult woman with urinary incontinence frequently exists in desperate isolation for fear of embarrassment or indignities. Hear the words of a prominent physician describing in 1835, when no treatments were available, the pathetic plight of the incontinent woman: "The refreshment of a change of clothing provides no relief, because the clean undergarment, after being quickly saturated, slaps against the pa-

tients, flopping against their wet thighs as they walk, sloshing in their wet shoes as though they were wading through a swamp. The bed does not soothe them, because a good resting place, a bed, or a horsehair mattress, is quickly impregnated with urine and gives off the most unbearable stench. Even the richest are condemned for life to a straw sack, whose straw must be renewed daily."

A 19th century physician from rural South Carolina provided medicine with its first reliable surgical intervention to correct a major form of urinary incontinence. J. Marion Sims, acknowledged by many as the father of operative gynecology, was born of humble origins in 1813, in backcountry South Carolina, the first of eight children. His mother's dearest wish had been that he seek a career as a Presbyterian minister. Instead he journeyed north, to the express distaste of his family, completing his medical education at Jefferson Medical School in Philadelphia. Sims then returned to the South and, during the next decade, established a flourishing plantation-based surgical practice in Mt. Meigs, Alabama.

In 1845, while vainly attempting to reduce a traumatically induced uterine retroflexion, he finally placed his patient in the knee-chest position, which, to his astonishment, caused instant relief for his patient and facilitated the external examination of the genito-urinary system. He was then able to visualize the vaginal vault directly; his full appreciation of any pathologic lesion was further enhanced when he used bent pewter spoons as hastily devised retractors. This experience introduced Sims to the awesome limitations of genito-urinary medicine in women. He had recently examined three local slave women each suffering from chronic vesicovaginal fistulae, a postpartum lesion then considered incurable. By means of his newly invented speculum, he was now able to see the fistulous defect and could therefore attempt a surgical repair. His initial efforts failed, however, and for years he tenaciously designed modification after modification until, in May of 1849, by employing silver wire sutures, he obtained an enduring closure of the fistula. The patient, a Negro slave named Anarcha, had undergone 30 unsuccessful operations by Sims before the fistula was effectively sealed off. By 1852, Sims had achieved 252 operative cures in 320 attempts, thus belying the gloomy words of Sir James Simpson, obstetrician to Queen Victoria: "A urinary fistula is an infirmity which is beyond all relief and all hope."

The Sims operation was widely acclaimed and for the next few decades this erstwhile rural surgeon demonstrated his

great skills throughout western Europe and the northern cities of the United States. In 1857 he co-founded the Woman's Hospital in New York City, the first American institution devoted exclusively to medical problems unique to women. His fame as an innovator of surgical procedures was accompanied, in later years, by muted criticism of his Victorian notions of woman's role in society, his arrogance and his habit of perfecting his operative techniques on enslaved or impoverished women. (While in New York City, Sims developed his many reconstructive and ablative operations on Irish immigrant women admitted to his hospital for free care.) In 1874 he was censured by the board of directors of the Woman's Hospital, the hospital he helped to found. At issue was Sims' demand that patients with breast cancer also be admitted and that the institution be regarded as a center for medical education and experimentation. The directors, on the other hand, perceived the hospital as a haven for the moderately ill woman who found the presence—and smells—of patients with advanced breast cancer to be both offensive and depressing. Furthermore, they contended, an educational environment meant an inevitable loss of privacy for their patients. For the remainder of his life Sims continued to consult; he accepted the presidency of the American Medical Association in 1875, dictated his autobiography, and returned to a deeply religious life contending, sadly, that his greatest wish in life, to enter the clergy, had been denied him.

Sims was a complex man, not easily understood; but no one appreciative of the devastating effects of incontinence could possibly diminish his contributions to the health and dignity of women. The techniques and operations that he designed represented the first inroads in the treatment of urinary incontinence. Kelly, another pioneer in gynecology, had said: "There is no more distressing lesion than urinary incontinence—a constant dribbling of the repulsive urine soaking the clothes which cling wet and cold to the thighs, making the patient offensive to herself and her family and ostracizing her from society."

No longer must indignity and isolation accompany urinary incontinence. The humiliating conditions of the past now readily yield to the evaluative tests, medications, operative procedures, and hygienic products described in this issue of RHODE ISLAND MEDICINE. Truly, competent intervention and assertive regard for the dignity of the patient have now been joined in the care of the incontinent person.

Stanley M. Aronson, MD

A Conspicuous Consumption

The hospital records state that Tom Wolfe died in the early morning hours of Monday, September 15, 1938. The great writer's passing, just weeks shy of his 38th birthday, was witnessed by his grieving family.

Wolfe, acclaimed by many as America's greatest prose writer of this century (and by others as an undisciplined, prolix and compulsively autobiographic scribbler) was completing a speaking and vacationing tour of the western states in June 1938. Accompanied by a few friends, he had embarked upon a motor car journey through all the western national parks—a stressful trek of 4662 miles in 13 days. When reaching Seattle he complained of fatigue and feverishness. Wolfe, a stranger to Seattle, could not locate a physician. He was finally examined on July 10 by a local psychiatrist who detected signs of a right upper lobe pneumonia and hastily placed him in a local psychiatric rest home, a facility without X-ray equipment. Within 3 days his fever subsided somewhat and Wolfe checked himself out. The fever resumed, however, and was now accompanied by unsparing headaches. He entered Providence Hospital in Seattle where chest X-rays confirmed the existence of a right upper lobe density. One internist thought that he also saw radiographic evidence of an old tuberculous lesion, but this was discounted by the others. A retinal examination was then undertaken showing bilateral papilledema. The ophthalmologist was alarmed that Wolfe might be harboring an expanding brain tumor and urged Wolfe's brother that he be transported immediately, by train, to Baltimore, there to be admitted to Walter Dandy's neurosurgical service at Johns Hopkins Hospital. Wolfe, still coherent, wrote a brief, prescient letter to his editor expressing, "... the impossible anguish and regret of all the work I had not done, of all the work I had to do—and I know now I'm just a grain of dust."

Accompanied by his brother and a nurse (Annie Crawford, RN, a family friend from North Carolina), Wolfe was borne across country, his headaches controlled by frequent doses of dilaudid. Both the brother and the nurse were warned of the imminence of seizures, which, however, did not materialize. Julia, Wolfe's mother, joined the anxious group in Chicago and was shocked by her son's evident weight loss. Wolfe was a large man, over 6 feet 6 inches in height. In the space of 6 weeks, he had lost some 50 pounds. The four reached Baltimore on September 6. Wolfe was now

profoundly confused, apathetic and uncharacteristically tractable. Had he been aware of his destination, he might have fiercely resisted admission. Some years previously, his father had died of cancer on the wards of this same hospital. In one of his novels, Wolfe wrote:

The great engine of the hospital with all its seeret, sinister and inhuman perfeetions, together with its clean and sterile smells which seem to blot out the smell of rotting death . . . an image of death drugged and stupified out of its aneient terror and stern dignities—of a shameful death that went out softly, dully in anesthetized oblivion, with the fading smell of chemicals on man's final breath.

On September 9 a suboccipital decompression was performed; the elevated spinal fluid pressure lessened somewhat and the incapacitating headaches remitted briefly. On September 12, Wolfe was returned to the operating room for an exploratory craniotomy. When the cerebral leptomeninges were finally exposed, Dandy observed large numbers of miliary opacities, tuberculous in nature, and he explored no further. On the morning of September 15, Wolfe died. The final diagnosis was tuberculous leptomeningitis. His physicians conjectured that a latent tuberculous locus in Wolfe's lungs (he was said to have contracted tuberculosis, as a child, from his father) was then activated by the early summer episode of bacterial pneumonitis resulting in a hematogenous spread of the tubercle bacilli to the cranial contents.

The body was brought to his place of birth in Asheville and funeral services were conducted in the local Presbyterian church. The minister's text came from Wolfe's own writings:

Where shall the weary rest? When shall the lonely of heart come home? What doors are open for the wanderer? And which of us shall find his father, know his faee, and in what place, and in what time, and in what land?

Thomas Clayton Wolfe was a native of piedmont North Carolina, born at the dawn of this century, the offspring of Appalachian folk who knew tuberculosis intimately. As a graduate student at Harvard in 1920, Wolfe had a succession of low grade fevers, one accompanied by a brief episode of hemoptysis. In 1936 he had "a touch of flu," and X-rays at that time disclosed an old tuberculous focus in the right upper lobe. Despite his morbid fear of tuberculosis, Wolfe persisted in his compulsive traveling, excessive drinking and smoking, living easily and carelessly.

In the face of disseminated tuberculosis,

physicians of 1938 could do no more than prepare the family for an inevitable outcome. Within decades, however, the components of dependable anti-tuberculous therapy—streptomycin, isoniazid, para-aminosalicylic acid, rifampin, ethambutol—would emerge and transform a frequently mortal disease into one amenable to successful treatment. Tuberculosis, the pervasive white plague of the 19th century, was now at the margins of public health control and by the decade of the 1950s health officials would confidently abandon hilltop sanatoria and inner city chest clinics. Truly, many naively believed, the recently devised battery of chemotherapeutic agents would establish a bright new consumption-free society since civilization, in principle, now had the therapies to rid itself of this societal scourge.

These fond hopes ignored such imponderables as altered immigration patterns, progressive mycobacterial resistance to hitherto effective antibiotics and the various new forces (iatrogenic, genetic, viral) leading to human immunodeficiency. The optimism of the 1960s was replaced in the 1990s by a somber recognition that tuberculosis was returning, often as antibiotic-resistant strains and that a new population of susceptibles—those with immunodeficiencies—were now providing a communal reservoir for the further propagation of the tubercle bacillus. The complacency regarding tuberculosis, in many ways, had returned medicine to the passive status of the 1930s when no specific agents had been available.

The overall numbers of reported cases of tuberculosis had actually dropped substantially after 1963 (when 54,042 cases were recorded) to 26,673 cases nationwide in 1992. Since then, however, there has been a resurgence of new cases. In 1993, for example, Rhode Island saw the tuberculosis incidence rate rise about 50% and the cumulative number of cases reported thus far in 1994 is above the figures listed for the previous year. Of greater concern, however, are the increasing numbers of acid-fast isolates that are antibiotic resistant.

In Wolfe's posthumously published epic, *You Can't Go Home Again*, the final paragraph reads:

To lose the earth you know, for greater knowing; to lose the life you have, for greater life; to leave the friends you loved, for greater loving; to find a land more kind than home, more large than earth—wherein the pillars of this earth are founded, toward which the conscience of the world is tending—a wind is rising and the rivers flow.

Stanley M. Aronson, MD

EDITOR'S MAILBOX

Trauma Cases Will Not Disappear

To the Editor:

Like most RI MEDICINE readers, I was fascinated by your June 1994 issue and its prognostications for the future of medicine in our state. However, I was disheartened to notice that essentially all of your authors disregarded our costliest health problem. For those under 45, injuries are the leading cause of death, and for all Rhode Islanders, including the elderly, they are the fourth most common. Injuries account for the most years of potential life lost (YPLLs) before age 65. Currently, nearly 450 die each year. In 1990, 7872 injured citizens were hospitalized at a cost of nearly \$58 million, not including major additional expenses of outpatient care, professional fees, disability support and lost revenues. All Rhode Islanders are at risk of serious injury, which most commonly involves working young men and motor vehicles. Less severe trauma affects thousands each year.

Fortunately, Barbara DeBuono, director of the RI Department of Public Health, and the Governor's Task Force for Year 2000 Health Objectives include injury prevention among their goals. (RHODE ISLAND MEDICINE, 77:183-185.) Dr Don Singer did acknowledge the need for blood volume replacement for trauma cases. However, each of the other articles totally ignores the importance of preventing injuries and the crucial role of a trauma system and a trauma center in preventing unnecessary death, disability, and expense in treating those who will inevitably be injured, even in the safest of societies, (which Rhode Island is certainly not!).

Astonishingly, Dr Culpepper kills off the state's trauma center, turning it into condominiums, and replacing its emergency and inpatient services with "community procedural and intensive care facilities." How can such a system ensure access to life- and limb-saving surgery within the "golden first hour" after injury? How can it ensure that the treating surgeon will have handled at least 50 major injury cases in the previous year, an expectation that the American College of Surgeons sets for qualified traumatologists?

In your June issue, the leaders of medicine in Rhode Island pay no attention to the need for trauma care for the young, the elderly, the pregnant, and the mentally ill. They fail to list prevention and treatment of injuries as a part of Brown's medical curriculum. They ignore the need for establishing a valid trauma system in our state, for ensur-

ing access to it for all Rhode Islanders, no matter which organization "maintains their health," or contracts to pay for their medical care. They ignore the vital investment of a portion of our health care resources in our as yet un-born regional trauma system, in spite of its having been proven to offer one of the highest returns to society (Most young trauma patients whose lives are saved in trauma centers return to productivity, paying back in taxes many times the cost of their care.)

Sadly, your futurist physicians are just like the rest of us, ignoring the facts of injury, and denying that it can and will

involve us. Until we establish a working trauma system, Rhode Island will remain like the other parts of America that lack one, accepting a rate of preventable deaths that most certainly will strike some of us, our families, our friends, and our patients. We serve those patients poorly by not joining together to inform and persuade our fellow citizens that trauma prevention and treatment are essential goals, and that establishing a statewide trauma system is the proven means to achieve them!

Peter G. Trafton, MD
Providence, Rhode Island

(Dr Trafton is associate professor, Brown University School of Medicine, and surgeon-in-charge, orthopaedic trauma, Rhode Island Hospital.—Ed.)

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Evaluation of Female Incontinence

Jacques Susset, MD

Factors easy to correct conservatively should be tackled first. Surgical intervention rarely should be considered as the first line of treatment.

Many factors involving both bladder (the pump) and urethral resistance (the brakes) cause urinary incontinence. Evaluation consequently should identify and measure the relative responsibility of each of these factors.

Factors Compromising Urethral Resistance

Urethral Hypermobility

Urethral hypermobility occurs when the urethra and vesical neck lack support from a deficient perineal floor musculature secondary to childbirth, trauma and/or hypoestrogenism. Both are displaced towards the vagina (urethrocyстоcele) outside the pelvic cavity. Normally, an increase in abdominal pressure caused by coughing or straining should induce the same increase in pressure in the urethra as in the bladder to prevent leakage. When the urethra and bladder neck are displaced to the vagina only a fraction of such abdominal pressure increase is transmitted to the urethra, resulting in leakage. We call it a pressure transmission defect, and it has to be measured since it may be complete or only partial.

Intrinsic Sphincter Deficiency (ISD)

The second important factor of stress incontinence (also called abnormal vesical neck patency) is the resistance of the vesical neck to increased intravesical pressure secondary to coughing or straining. The vesical neck is also called the intrinsic sphincter. The way ISD develops is not well understood, but it seems to occur independently of muscular weakness and urethral hypermobility. It will also require a different therapeutic approach.

External Urethral Sphincter Deficiency

The third factor is external urethral sphincter deficiency. Normally when abdominal pressure increases suddenly, due to cough or straining, a reflex contraction of

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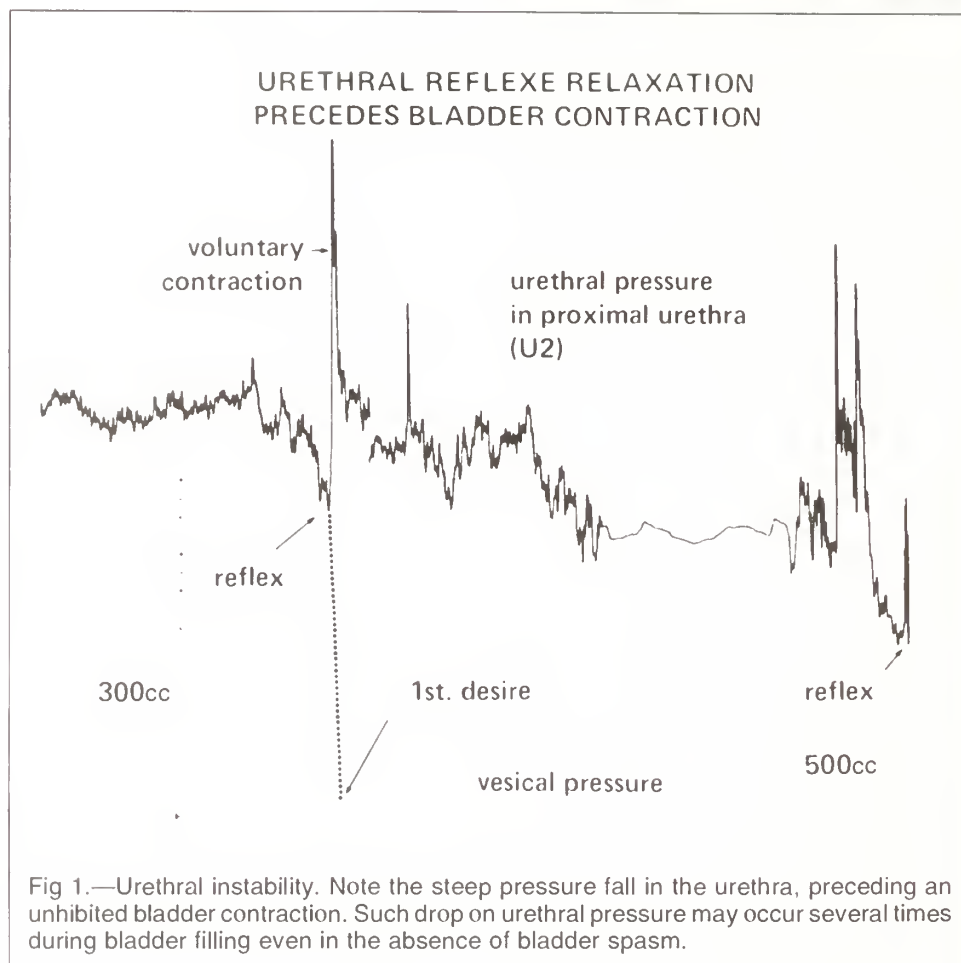


Fig 1.—Urethral instability. Note the steep pressure fall in the urethra, preceding an uninhibited bladder contraction. Such drop on urethral pressure may occur several times during bladder filling even in the absence of bladder spasm.

the perineal muscles and particularly of the external striated sphincter occurs. The sphincter needs to be strong enough to prevent leakage.

Urethral Compliance

The fourth factor of urethral resistance is represented by the condition of the urethra itself. The urethral smooth muscle may show evidence of hypotony or hyperlaxity due to excessive relaxation. On the contrary, the urethral canal may be abnormally rigid neither opening nor closing well. This may be due to chronic non-specific urethritis, which is very common in younger women, and may result in secondary periurethral fibrosis. It could also be due to hypoestrogenism since the urethra, like the vagina, responds to this condition by atrophy and increased collagen deposit. Finally, such rigidity may be iatrogenic, secondary to previous vaginal surgery.

Urethral Hyperreflexia

Sudden relaxation of the urethra during bladder filling is the basis for urethral hyperreflexia. A drop of urethral pressure of 5 to 10 cm/H₂O is observed, which may last for a few seconds as cystometry progresses. It appears to result from beta-adrenergic receptor action and remains poorly explained. It may or may not be associated with detrusor hyperreflexia (Figure 1).

Urethral Shortness

A significantly shorter functional urethral length at rest in young nulliparous incontinent women (possibly congenital) may predispose to incontinence.

ABBREVIATIONS USED

ADH: Antidiuretic hormone
CMG: Cystometrogram
EMG: Electromyogram
ISD: Intrinsic sphincter deficiency

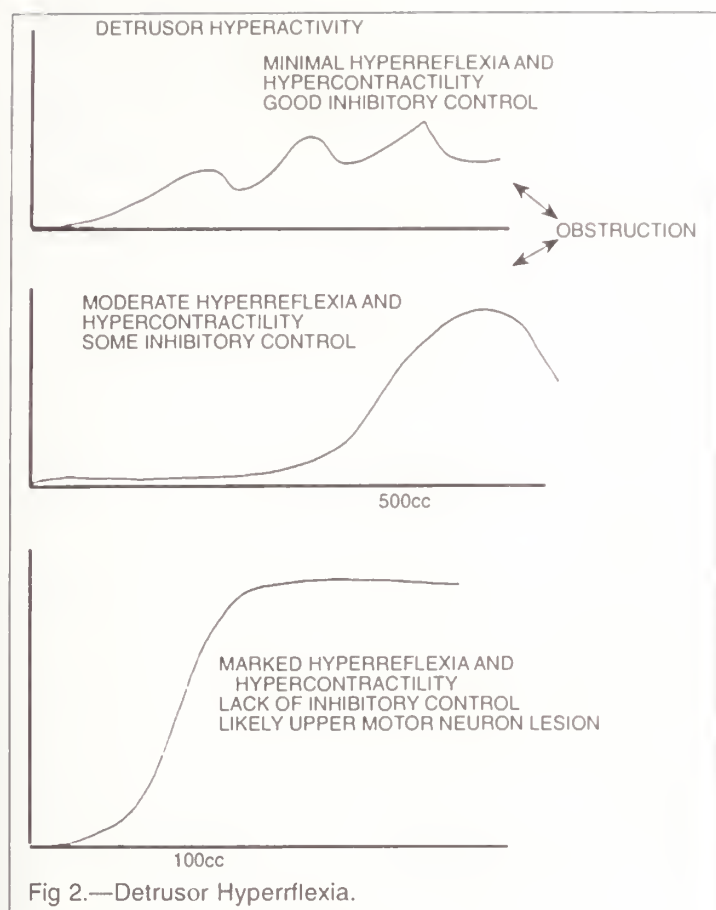


Fig 2.—Detrusor Hyperreflexia.

Evaluation of Vesical Factors

Detrusor Instability and Detrusor Hyperreflexia

Detrusor hyperreflexia is the occurrence of strong bladder spasm at very low bladder filling and usually causes spontaneous or urgency incontinence (Figure 2). It results from the loss of cortical control over the sacral reflex arc and is commonly observed after a stroke or simply in aging females with or without other neurological abnormalities. It is also seen in multiple sclerosis or Parkinson's disease or due to a cervical or thoracic cord compression.

Detrusor instability is characterized by bladder spasm occurring later during bladder filling and usually of lower intensity. Detrusor hyperreflexia and instability are often observed in patients presenting urgency incontinence since sensory urgency without bladder spasm is common.

Abnormal Bladder Compliance

Low compliance such as in cystitis may contribute to incontinence (Figure 3). A loss of functional bladder capacity may also be seen in severe cases of incontinence preventing bladder storage; the latter is usually reversible.

High compliance may be contributing to the problem when the bladder becomes atonic and/or acontractile and contains a large

amount of residual urine. The resulting overflow incontinence may present itself as a stress incontinence.

An abnormally high fluid intake often constitutes a factor of incontinence and may trigger it in females predisposed to this condition in view of their low urethral resistance and abnormal bladder behavior.

Resnick¹ has nicely coined the mnemonic "DIAPPERS" as a help to recall these factors that commonly trigger urinary incontinence, especially in the nursing home population (see paper by Greer, this issue).

Medications that can cause incontinence are listed in Table 1.

Several of these urethral and vesical factors are often associated in a given patient. Whether the incontinence appears to be only due to stress, to urgency or to both, each patient is different, and the degree of responsibility of each factor varies from one woman to the other. We are now far from the old concept that stress incontinence is only related to bladder displacement. Each patient has her own etiological label which in many instances will remain a mystery unless a complete factor analysis is carried out.

The Evaluation Begins with the Case History

A post-menopausal woman, particularly if she has not taken estrogen regularly, may

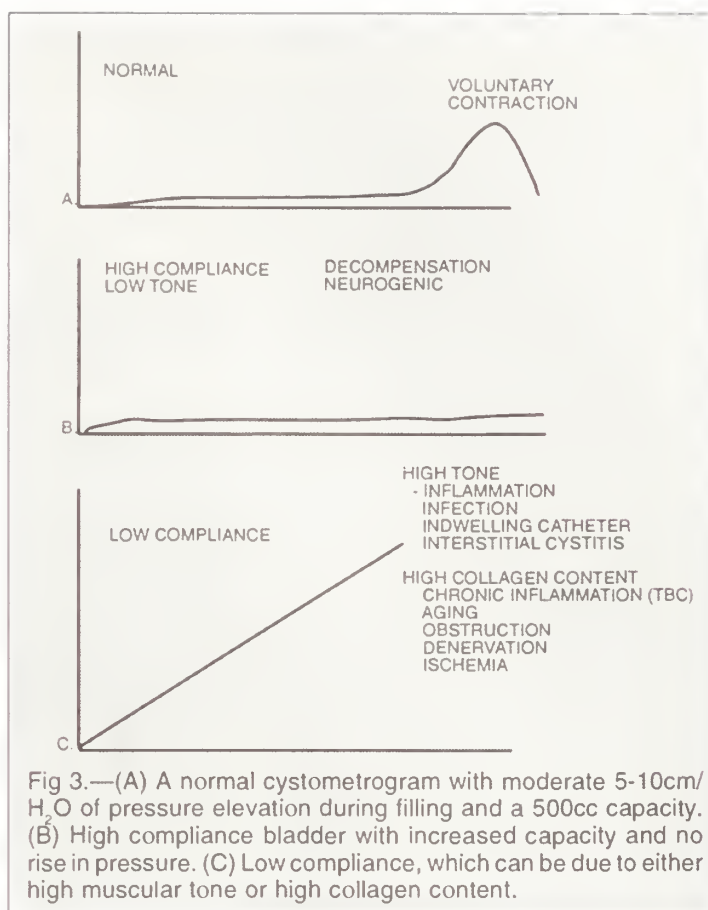


Fig 3.—(A) A normal cystometrogram with moderate 5-10cm/H₂O of pressure elevation during filling and a 500cc capacity. (B) High compliance bladder with increased capacity and no rise in pressure. (C) Low compliance, which can be due to either high muscular tone or high collagen content.

Table 1.—Common Medications That Can Cause Incontinence

Sedative Hypnotics

Flurazepam
Diazepam
Ethanol

Diuretics

Furosemide
Ethacrynic acid
Bumetanide

Anticholinergic Agents

Antipsychotic agents (especially thioridazine)

Antidepressants (especially amitriptyline)

Drugs for Parkinson's disease (trihexyphenidyl and bethtropine mesylate, but not L-dopa or selegiline)

Disopyramide

Antispasmodic agents (eg, donnatal, dicyclomine)

Antihistamines

Antiemetics

Opiates

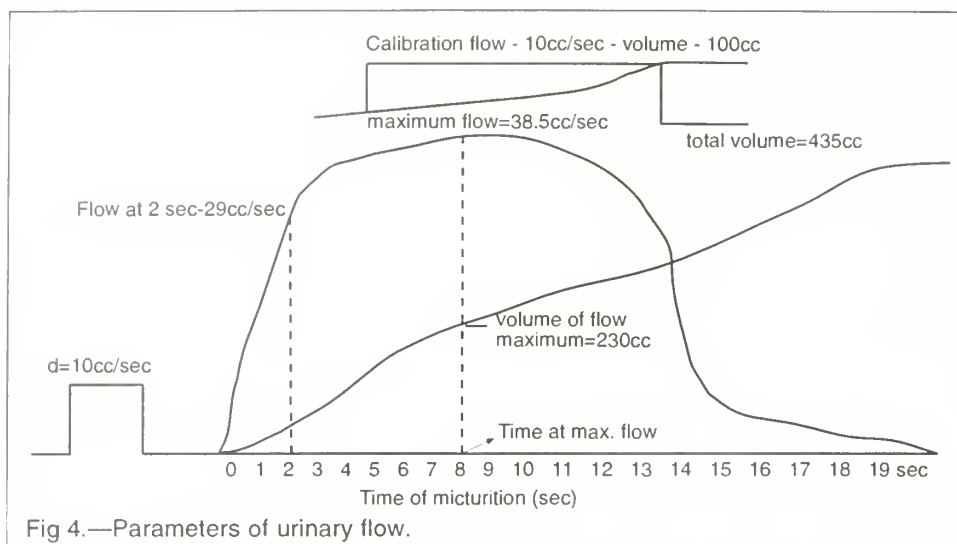
Adrenergic Agents

Sympathomimetics (eg, decongestants)

Sympatholytics (eg, antihypertensives)

Calcium Channel Blockers Vincristine

Adapted from Resnick NM. Urinary incontinence in the elderly. *Med Grand Rounds*. 1984;3:281-290.



have developed muscular atrophy or urethral rigidity. Aging may also favor the occurrence of bladder instability.

Associated neurological symptoms may point to the possibility of a lower motor neuron lesion causing perineal muscular incompetence or to an upper motor neuron lesion causing bladder spasm and sometimes pelvic floor spasticity and detrusor-sphincter dyssynergia.

Multiparity or difficult deliveries are certainly a recognized cause of urethral hypermobility.

If the incontinence only occurs in the sitting or standing position the possibility of intrinsic sphincter deficiency should be contemplated knowing that such condition may trigger bladder spasm since urine is always present in the urethra. In case of urgency the presence of bladder spasm needs to be confirmed or ruled out since such urgency could be due to a sensory defect often secondary to urethro-trigonitis that usually responds poorly to anti-cholinergics.

Patients should be asked about their flow rate, which may be difficult to start or is interrupted or slow. In such instances, the possibility of urethral and vesical neck stenosis or detrusor incompetence is suspected.

Very important is an estimate of average fluid intake that may be astounding and somewhat illogical in severely incontinent patients. Patients should systematically be asked about their approximate amount of daily fluid intake in case of incontinence or abnormal day or night frequency of urination. Abnormal frequency can also be due to an associated non-specific urethrotigonitis. This is most probable when suprapubic or urethral discomfort or burning on urination are present.

The history should pay particular attention to medications especially in the older population.

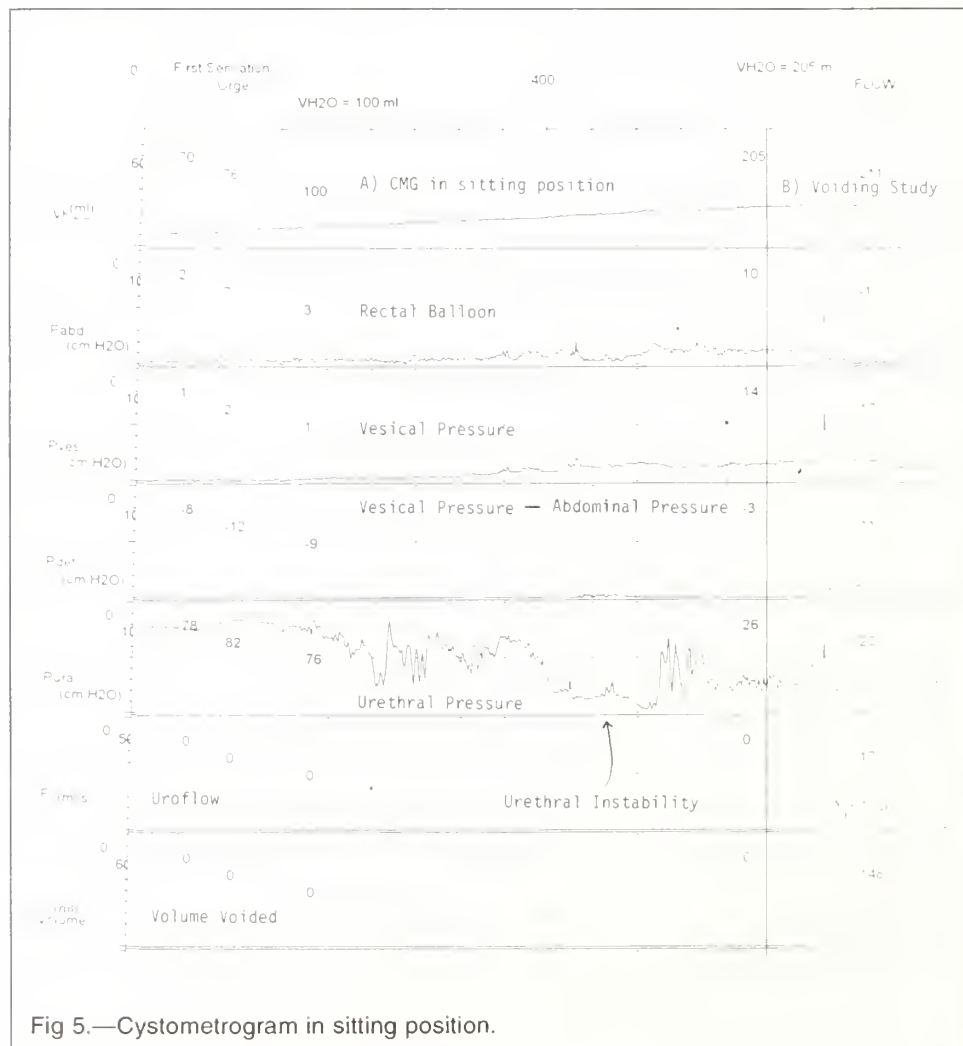
Physical Examination

The presence and degree of cystocele are noted. A prolapse with Grade III or IV cystocele constitutes a category in itself. In such instances the prolapsed cystocele should be reduced preferably by a sponge on a forceps placed in the vagina and patient asked to cough in the standing position after reduction of cystocele. Such patients may

have initially a significant volume of residual urine. Stress incontinence following such reduction sometimes appears worse than before it. These patients often constitute a clear-cut surgical indication and should preferably be treated by a sling procedure.

The degree of urethral mobility may easily be assessed by placing a Q-tip in the urethra and asking the patient to strain to the maximum in a supine position. The change in angulation of the Q-tip between the resting and maximum straining position should not exceed 45 degrees and possibly less than 30 degrees. A marked displacement of the Q-tip of more than 45 degrees means abnormal urethral mobility, which is obviously the most common factor in stress incontinence.

The patient is asked to hold and contract her levator ani over the examining fingers. The strength is rated between 0 to 5. A large number of women do not know how to contract these muscles. If re-education is contemplated such women should first be submitted to electrical stimulation. This should help them to discover their muscles. When the bladder is reasonably full the patient is asked to cough in both supine and



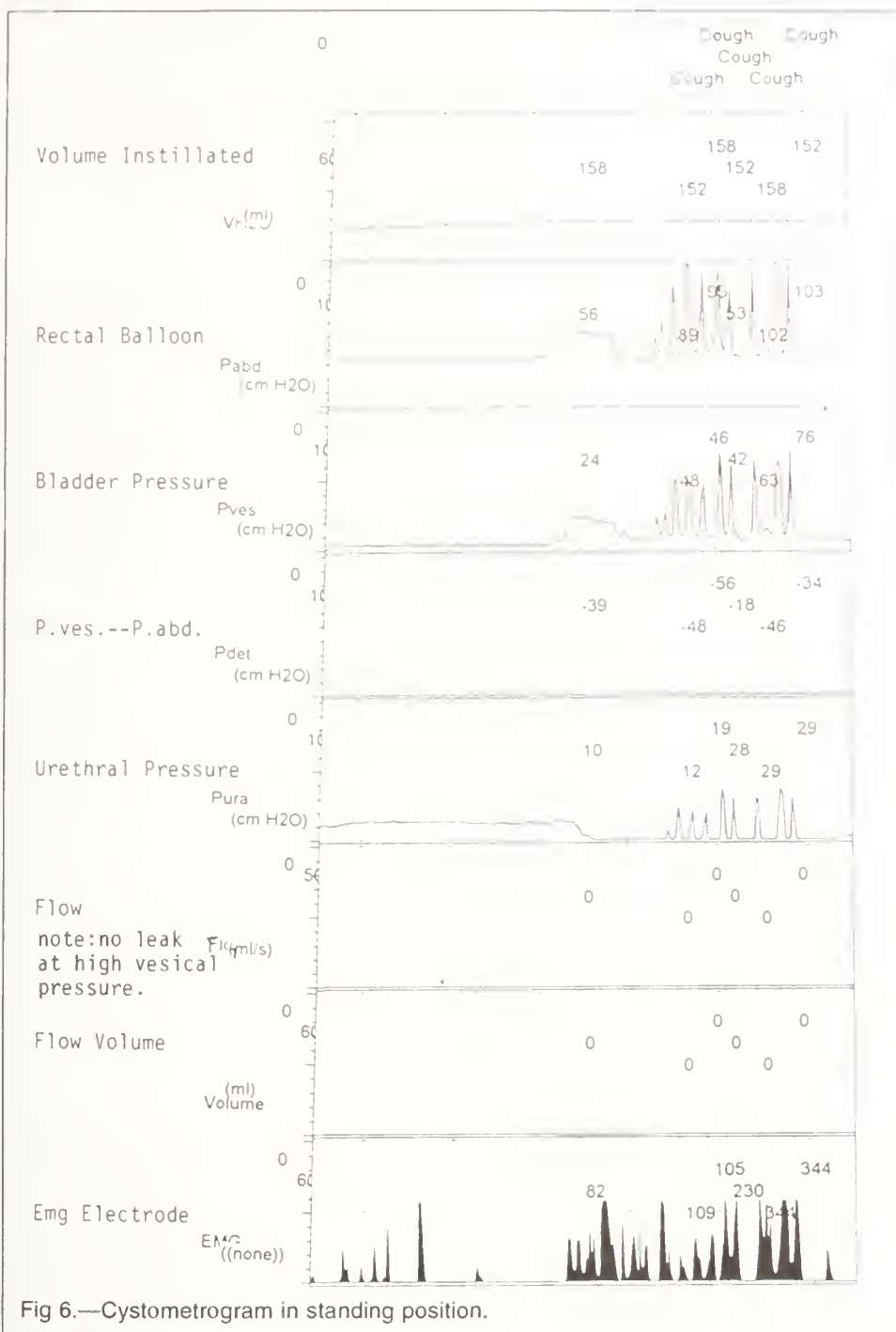


Fig 6.—Cystometrogram in standing position.

standing positions. This determines the severity of the incontinence.

Patients should be evaluated for possible re-education as well as the impact of incontinence on social life and personal needs, such as athletic activity. Besides, it is important to know how patients perceive their incontinence, which is often independent of the degree of leakage, and may cause serious depression particularly among the elderly.

Urodynamic Studies

These studies are indispensable for the identification and measurement of the many factors, which can be involved in the etiol-

ogy of the problem and cannot be possibly documented by history and physical alone.

Uroflowmetry^{2,3}

This is done routinely. A very steep acceleration of the flow with a peak flow at the upper limit of normal suggests a low urethral resistance and a satisfactory bladder contraction. An irregular interrupted flow points to either a lack of relaxation, which could be secondary to an inflammatory process such as urethrotrigonitis, or to a weak bladder, which needs straining to empty (Figure 4). A flow rate below normal suggests either a cervico-urethral obstruction or a weak bladder wall or both. A

voiding study will help differentiate between these two conditions. The patient is then catheterized for residual urine.

A three-way #7 catheter is then introduced to the bladder to simultaneously fill it up and record both intravesical and intra-urethral pressures. A rectal balloon is used to record intra-abdominal pressure and a perineal electrode is placed to monitor the EMG of the pelvic floor to make sure that the patient is relaxed during the voiding event. The catheter is positioned in a way to ensure that one of the 3 holes sits in the proximal urethra in order to monitor intra-urethral pressure during bladder filling to rule out the possibility of urethral hyperreflexia

Cystometrogram⁴

The examination is currently repeated in both sitting and standing positions. A voiding study is done between the two examinations.

CMG in Sitting Position

As the bladder is filled at a speed of 80cc/min the three pressures (vesical, urethral, rectal) are recorded together with the anal sphincter EMG. The following factors are noted:

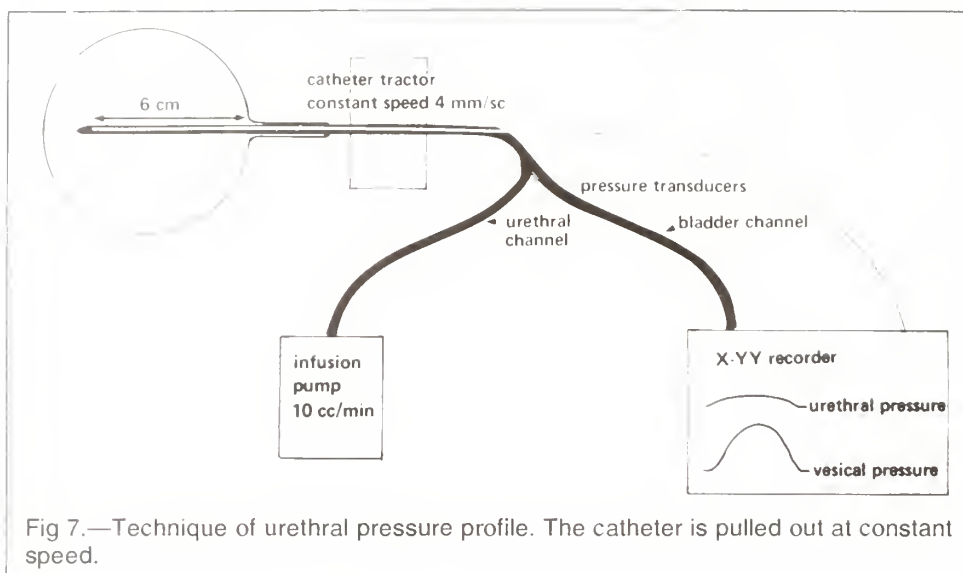
1. threshold of bladder sensation;
2. bladder capacity and compliance; and
3. presence and characteristics of abnormal bladder contraction. Normally a bladder does not contract on filling (Figure 5).

Voiding Study⁵

This is done when the maximum functional bladder capacity is reached. The above-mentioned values (3 pressures and EMG) are recorded together with the flow rate. This allows an evaluation of urethral resistance (Figure 5): Low vesical pressure plus high flow equals low resistance. High pressure plus low flow equals high resistance that is possible obstruction. Low pressure plus low flow does not differentiate between poor bladder contraction and obstruction.

CMG in Standing Position (Figure 6)

The bladder is now filled in the standing position and some bladder spasms may only appear in the standing position and not be present in the sitting position revealing a bladder hyperreflexia that would not have been diagnosed otherwise. When 200cc have been instilled the perfusion is stopped. Patient is asked to strain and then to cough slightly first, then increase the intensity of the coughing. This usually is done five to six times. Patient is watched for the occur-



rence of leakage.

ISD is present when leakage occurs under this condition with an intravesical pressure less than 60cm/H₂O. The patient is placed back in supine position.

Urethral Pressure Profile⁶⁻⁸

The same 3-channel catheter is used for the urethral pressure profile. It is pulled at constant speed with a special puller. The urethral pressure is recorded through a small hole placed 6 cm from the tip of the catheter and perfused with saline at 2cc/min/ (Figure 7). The procedure is repeated four times in a row (Figure 8).

At Rest

The functional urethral length is meas-

ured and found to be between 25–40 mm with 30–35 mm as an average. Maximum closing pressure varies with aging, as well as the size of the recording catheter. In young women it reaches 60–80cm/H₂O. In older women, due to mucosal and muscular atrophy, it may only reach 20 to 30 cm/H₂O.

Manual Compression of the Bladder

Such compression attempts to produce an increase in bladder pressure of 25cm/H₂O, which is maintained as the catheter is pulled out of the urethra. The urethral length is compared between the compressive and resting profiles. A reduction of over 8 mm in functional urethral length means ISD. The urethra is literally “vesicalized” (Figure 9).

During Voluntary Perineal Contraction

The difference in maximum urethral pressure between tracings obtained at rest and maximum contraction measures the strength of the sphincter. A difference of at least 30cm/H₂O is normally observed.

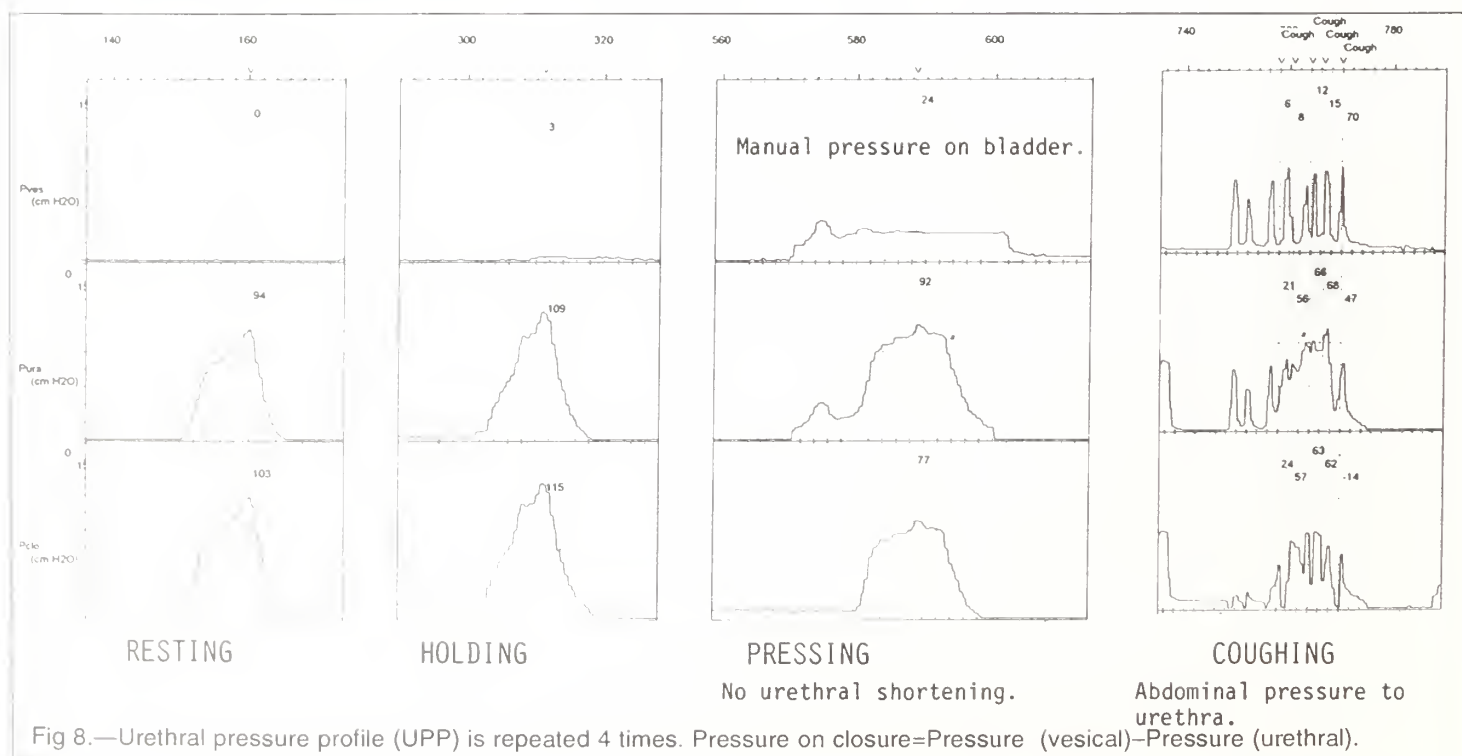
During Coughing.

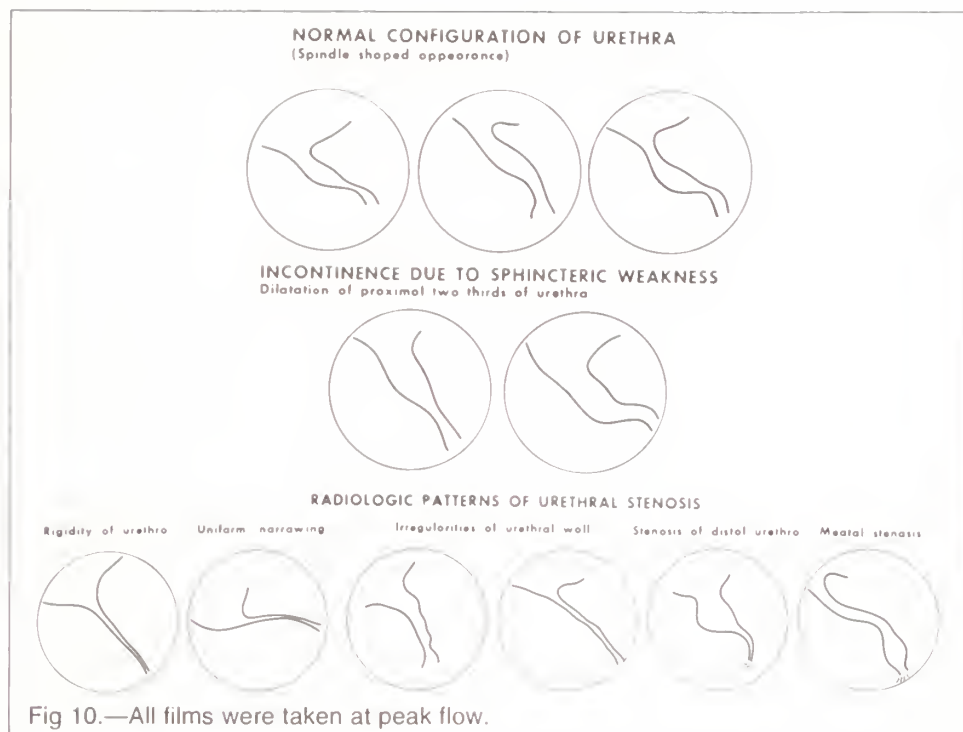
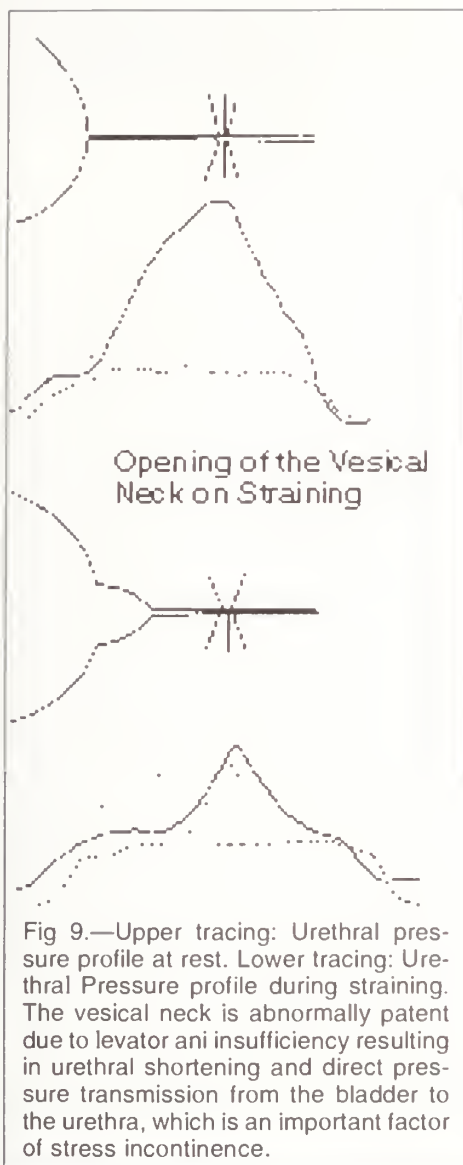
The patient is asked to cough repeatedly while both intravesical and urethral pressures are measured simultaneously. Normally the same pressure should be observed in the urethra and bladder, if the urethra is in a good position. A reduction in the percentage of pressure transmission to the urethra measures the degree of urethral mobility and displacement, since the urethra needs to be in a normal intrapelvic position to record the same pressure increase as the bladder during a coughing event.

The whole urodynamic testing should not exceed 45 minutes.

Voiding Cysto-urethrography

Advanced urodynamic equipment now allows the superposition of pressures and flow recording to a fluoroscopic or ultrasound image. It is useful to observe the condition of the posterior and anterior vesico-urethral angles with a small urethral catheter in place. It shows well the degree of vesical neck and urethral mobility and displacement on straining as compared to the resting position. It allows one to make a diagnosis of ISD by recording the pressure necessary to open the vesical neck. The





shape and diameter of the urethra at peak-flow can then be evaluated (Figure 10). This test is important but not indispensable for this author, in the majority of cases.

Conclusion

At the end of this evaluation it is usually easy to enumerate the etiologic factors involved in a particular patient with incontinence and have an idea of the responsibility for each of them in the patient's symptoms.

The evaluation directly influences the treatment that should be undertaken ac-

cording to some easily understandable principles:

- The correction of one factor alone may not cure totally the incontinence.
- Incontinence is a sign of urinary imbalance that may be triggered by a minimal additional factor in patients already predisposed to this complication.
- If incontinence can be triggered by a minimal factor, it can consequently be cured by a minimal intervention. For instance, lowering fluid intake to normal or stopping smoking and coughing may

Table 2.

Factors of Incontinence	Management	Pharmacology	Surgery
Urethral Hypermobility Pubococcygeal Incompetence Striated Sphincter Incompetence	Reeducation Biofeedback ES/50CPS	Estrogens	Urethrocystopexy
Intrinsic Sphincter Deficiency Short Urethral	Contigen Implant		Sub-urethral Sling
Urethral Rigidity Urethral Hyperlaxity Urethral Instability		Estrogens Alpha-Stimulants Beta-Blockers	Urethral Dilatation
Meatal Stenosis Vesical Neck Stenosis			Meatoplasty Transurethral Resection Or Incision
Chronic Urethritis Cystitis		Antibiotics Anti-inflammatory	
Contracted Bladder			Bladder Dilatation Intestino Cystoplasty
Detrusor Hyperreflexia Instability	ES/15CPS	Anticholinergics	Nerve Block and Neurotomies Intestino-cystoplasty
Vesical Distention	Catheterization	Urecholine	
Polyuria	Fluid Restriction	A.D.H.	Treatment of Obstruction

be sufficient to cure the condition. Similarly, muscular re-education may cure the condition even if the effect of the treatment is often difficult to measure objectively with our methods that may not be sensitive enough.

- Factors easy to correct conservatively should be tackled first. Surgical intervention should rarely be considered as the first line of treatment. Such statement does not usually apply to incontinence associated with prolapse and severe cystocele that often require surgery, at least in younger patients.

Table 2 illustrates the role of factor evaluation in the choice of treatment.

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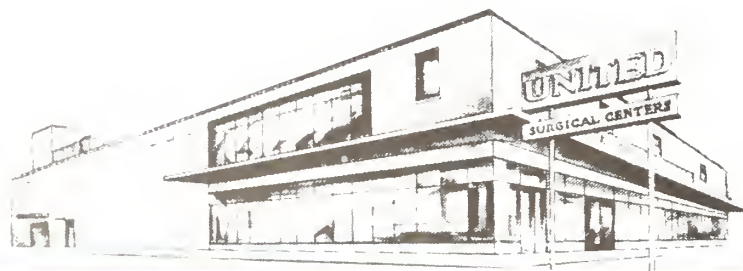
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Non-surgical Treatment of Female Incontinence

Neil D. Jackson, MD

Essential to consideration of therapy for urinary incontinence is an accurate diagnosis of the underlying pathophysiology creating the problem. With diagnosis well in hand, one can then launch a therapeutic regimen appropriate to the problem. In general terms, the therapeutic program for each patient should use all potentially helpful non-invasive measures before resorting to surgery. In most instances, even though the patient may end up choosing surgical therapy, the non-invasive measures employed may benefit the eventual surgical success.

Basic to understanding non-invasive therapy is a brief review of the normal physiology of the lower urinary tract. During the filling phase, the bladder and urethral sphincter are governed by the sympathetic thoracolumbar outflow tracts. Due to the predominantly alpha-adrenergic receptors in the proximal urethra and beta-adrenergic receptors in the body of the bladder, there is resultant bladder wall relaxation and urethral sphincteric contraction during filling. Additionally, all the structures that contribute to urethral sphincteric control have estrogen receptors and are, therefore, estrogen dependent. Most of the sphincteric function of the bladder is smooth muscle, but there is a small striated muscle component to the urethra which in normal circumstances contributes little but can be the target of voluntary exercise activity to aid closure function.

Pelvic Floor Exercises

For many years, patients with urinary incontinence have been told to use Kegel's exercises. Attention has been drawn to the perineal muscle group by telling the patient to contract the same muscles they would use when trying to stop urinating. This uses the accessory striated muscle group near the urethra to assist in urinary containment.

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Caution should be observed to explain in some detail exactly which exercise to employ. Patients can become easily confused and do an expulsive Valsalva maneuver, defeating the purpose of the exercise entirely. When employing the correct muscle group, circumferential tension will be felt at the introitus when an examining finger is in the vagina. Patients should be encouraged to use this for confirmation until they are certain of what they are doing. They are asked to contract the muscle group and hold it for a count of three. This is repeated for 10 contractions 4 times per day for a total of 40 contractions or squeezes in all. It is best to do these at a time other than voiding, since there is a possibility of creating a voiding dysfunction when done during bladder emptying.

... the therapeutic program for each patient should utilize all potentially helpful noninvasive measures before resorting to invasive surgical procedures.

Although many patients can identify and exercise their perineal muscle group, there are many who cannot. Some of these individuals can be taught through various biofeedback devices. The first is a series of progressively weighted vaginal cones that fit in the vagina and require tightening of the muscles surrounding the introitus for retention. Patients are asked to insert these cones and carry them for a few minutes twice each day. As they respond, cones of greater weight are added and for longer periods of time. An alternate method is a pelvic perineometer that fits in the vagina and visually records the strength of muscle contraction through a simple air pressure gauge attached to a flexible rubber cone. More elaborate vaginal pressure devices can record strength of contractions from the vagina by sight, sound or both, and reinforce an individual's efforts. A record of the exercises can be kept at home by electronic monitoring and replayed in the office to aid in the surveillance of a patient's progress and compliance with the program. Of course, all of these more elaborate measures are

There are numerous non-invasive treatments for urinary incontinence in the female, and each is directed towards the specifically identified mechanism responsible for the incontinence.

proportionately more expensive. For those patients that have the most difficulty with perineal muscle identification, one can use a low voltage electrical stimulating device that is placed in the vagina and can stimulate muscle contractions according to a pre-arranged program.

Pessaries

Most patients with urinary incontinence have pelvic prolapse as well. Frequently these problems are interrelated functionally as in the case of Genuine Stress Incontinence. Replacement of the prolapse with a vaginal pessary provides a non-invasive way to help both situations. Pessaries work on the basis of relative narrowing of the introitus in relationship to the cross sectional diameter of the vagina and the retaining potential of the subpubic arch. The writer prefers ring pessaries with support as a first choice and Gelhorn pessaries as a second alternative. A word of caution, however, against the use of the rigid Gelhorn: the flexible Gelhorn is preferred and is less likely to lead to vaginal narrowing and difficulty in removal. All pessaries should be fitted so that the smallest size that can be retained is used. If a patient cannot remove and replace it herself, she must be seen in the office every 6 to 8 weeks to clean the pessary, inspect the vagina for any irritation and cleansing with an antiseptic solution. At least once weekly, one should apply 1 gram of estrogen cream to the vagina.

Pharmacologic Therapy

Medications address specific problems in autonomic control of the bladder. During voluntary voiding there is a switch from sympathetic adrenergic mediated control of the bladder, active during the filling phase of lower urinary tract function, to parasympathetically controlled contraction of the bladder smooth muscle musculature. This well-coordinated wave of smooth muscle contraction in the wall of the bladder is stimulated by a cholinergic discharge, ces-

ABBREVIATIONS USED

GAX: Gluteraldehyde cross-linked bovine collagen

sation of sympathetic control and relaxation of the bladder neck urethral closure. This is under voluntary control. In patients with an unstable bladder (Detrusor Instability), involuntary contractions of the bladder occur with resultant voiding. Since this, too, is cholinergically mediated, it only follows that patients with this problem would respond to anticholinergic medications. Pro-Banthine (Propantheline 15 to 30 mg 3 times per day) and Ditropan (Oxybutynin 5 mg 3 or 4 times per day) are two examples with proven benefit. Caution in the use of these medications should be exercised in patients with glaucoma.

Most patients with urinary incontinence have pelvic prolapse as well.

When incontinence is due to a deficiency of the urethral closure mechanism, a function of alpha adrenergic mediated control, a drug that would enhance alpha adrenergic stimulation would lead to stronger smooth muscle contraction, ie, better closure. Phenylpropanolamine (Entex 75 mg every 12 hours) is the preferred drug of the author for this purpose. Ephedrine or pseudoephedrine are other alternatives. All these drugs have pressor amine properties and are thus contraindicated in patients with hypertension.

Many times the patients seen in a tertiary incontinence facility such as the Center for Women's Surgery have mixed incontinence with more than one operative mechanism responsible for the incontinence. An example frequently encountered is the patient with Detrusor Instability (unstable bladder) as well as Intrinsic Sphincteric Deficiency. In such a patient one would look to a drug with anticholinergic properties to suppress the bladder wall contractions and alpha adrenergic properties to augment urethral closure. A drug with such bimodal properties is the tricyclic antidepressant Imipramine (Tofranil). It has a pronounced dual purpose on the bladder and urethra in a dose range far less than is used for antidepressant effect. Ten to 25 mg 2 or 3 times per day is sufficient. As with the other anticholin-

ergics, the principal side effects are dryness of the mouth, drowsiness and possible blurring of vision.

Collagen

In the past few months a new treatment regimen has been approved by the Federal Drug Administration. Clinical trials have been conducted for the past 4 years and have proven quite successful in addressing incontinence due to an Intrinsic Sphincteric Deficiency. The principal behind this treatment is to inject a permanent bulking agent under the urethral mucosa that would enhance the urethral closing mechanism. The agent used is GAX Collagen (glutaraldehyde cross-linked bovine collagen). By this processing there is a marked reduction in hypersensitivity to the material. Although the incidence of sensitivity to GAX Collagen is rare, all patients are skin tested a month before the injection.

GAX Collagen is injected during cystourethroscopy and can be performed under local anesthesia in an office or outpatient surgery center. Since it is easily done under local anesthesia and is a very brief procedure, it can serve patients with medical problems that contraindicate other far more invasive surgical corrective procedures. An additional benefit is that the impact on the patient's incontinence is immediately apparent. Some patients have to self-catheterize intermittently for a short time. All patients are taught to self-catheterize before undergoing the injection. The use of GAX Collagen injection has been restricted to certain centers that have undergone approved preceptorship training.

Summary

There are many non-invasive treatments for urinary incontinence in the female, and each is directed towards the specifically identified mechanism responsible for the incontinence. Alone such therapies can often reverse the process and return the patient to a continent state. When not sufficient by itself, at the very least these non-invasive techniques can aid and support definitive surgical therapy, thereby increasing the possibility of ultimate success.

Note: The Agency for Health Care Policy and Research has issued clinical guidelines for the management of urinary incontinence. These guidelines include helpful algorithms for the evaluation and management of urinary incontinence and are available through the Center for Research Dissemination and Liaison, AHCPR Clearinghouse, PO Box 8547, Silver Spring, Maryland 20907.

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Surgical Repair of Stress Urinary Incontinence

Raul C. Ordorica, MD

Regardless of method, all surgical procedures used to treat genuine SUI aim at supporting the bladder within the pelvic cavity.

Female continence is dependent on multiple factors. These include the mucosa and underlying support tissue for adequate coaptation and sealing, internal and external sphincter mechanisms for urethral closure, and the anatomic location of the bladder neck and urethra to counteract acute elevations in abdominal pressure. The proper location of the bladder neck and urethra is for these structures to be maintained within the pelvic cavity. Elevations in intra-abdominal pressure that otherwise would act as an expulsive force alone are then distributed equally to the bladder neck and urethra, which remains closed. While defects in any one of the aforementioned mechanisms can be compensated by the other factors, we normally associate the presence of stress urinary incontinence (SUI) with the weakening of anatomic support of the bladder base and urethra. This focus on anatomic positioning is the basis for the surgical correction of this defect in those patients in whom non-operative measures have failed to relieve the incontinence.

There are multiple surgical approaches for the treatment of anatomic SUI. While these all generally provide good results as initial cure of SUI, they do vary in their approach, associated morbidity, and long-term benefit. A review of the pathophysiology along with the various procedures to cure this condition may assist in the management and guidance of patients who are seeking care for their incontinence.

Pelvic Floor Relaxation Pathophysiology

The bladder base and proximal urethra are supported in a retropubic position by the anterior vaginal wall. The vaginal wall is attached to the pelvic diaphragm, which is composed of the levator muscle groups and the perineal musculature. Endopelvic fascia condenses along the urethra providing additional support. Compromises in these support structures can lead to descensus of the bladder and urethra.

The primary force that acts upon the

pelvic floor is gravitational, which is increased by those activities that increase intra-abdominal pressure. Thus, acts such as coughing, sneezing, and lifting can result in displacement of the bladder neck and urethra with subsequent incontinence. Congenital weakness of the pelvic supports, difficult labor, multiparity, and menopause can cause weakness of those structures that support the bladder base and urethra. Iatrogenic factors can include prior surgery such as hysterectomy with interruption of the pubocervical fascia. Additional influences include obesity and chronic cough, which can place increased demands on the continence mechanism.

Evaluation of Patients with SUI

The goal of evaluating women with SUI is to determine those elements that may be contributory. Key to this evaluation is the taking of an accurate history. The patient should not only quantify the degree of incontinence but also clearly identify those events that accompany the loss of urine. Patients with SUI typically give a history of episodic leakage with those events that create elevations in intra-abdominal pressure such as coughing, sneezing, lifting, or standing up. In contrast is the patient with urge incontinence in whom bladder instability is suspected. These patients note the inability to control actual urinary flow that may provoked by certain activities. It is not unusual to find a combination of symptomatology, and therapy aimed at curing the "stress" component of the incontinence most often will provide relief from both causes of incontinence. However, identification of bladder instability may be beneficial since that therapy can be primarily pharmacologic (see Dr Jackson's article), and poor outcome from surgery may be avoided.

The second component of evaluation of patients with SUI is the physical exam and laboratory testing. These include not only determination of the anatomic position of the bladder but also the functioning of the urethra, along with bladder capacity, compliance, and the presence of instability. Routine testing for patients with incontinence also would include urinalysis to rule out the presence of infection or to detect hematuria that may indicate calculi or urothelial carcinoma.

The determination of the anatomic posi-

tioning of the bladder can be made by multiple techniques. Physical examination of the anterior vaginal wall while the patient is in the lithotomy position can determine if there is urethral descensus. With the bladder filled the patient is asked to cough and strain, and leakage then would be accompanied with rotational descent of the bladder and urethra. Further determination of this can be made by placement of a lubricated Q-tip within the urethra to measure the degree of rotation. As the patient coughs or Valsalva's, the external tip of the Q-tip will deflect upward depending on the degree of descensus. Other methods to quantify the anatomic location of the bladder and urethra include the use of lateral cystography with or without a radio opaque marker within the urethra, or the performance of real time fluoroscopy as the patient Valsalva's in the upright position.

The actual classification of bladder location as it relates to SUI was initially developed by Green,¹ which was then modified by the works of McGuire² and subsequently Blaivas.³ This most recent classification separates patients with SUI between those with varying degrees of bladder neck descensus and those in which the bladder neck and urethra is fixed and open (Intrinsic Sphincteric Deficiency, or ISD). Patients who have SUI with readily demonstrable descensus are termed to have "genuine" SUI and are amenable to surgical repair by procedures that restore the bladder to the correct anatomic position. The importance of this distinction is that routine surgical methods that are applicable for patients with genuine SUI typically will fail when used for ISD. Those patients who have SUI secondary to ISD require procedures that restore urethral competence through compressive forces that result in coaptation of the mucosa. Actual determination of urethra and bladder function require urodynamic testing, as covered by Dr Susset's article in this issue.

SUI Surgery

Once genuine SUI has been determined, placement of the bladder to its correct anatomic position will result in correction of

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ABBREVIATIONS USED
ISD: *Intrinsic sphincteric deficiency*
SUI: *Stress urinary incontinence*

the condition in the most cases. Surgery for SUI falls into two broad categories based on operative approach: open abdominal procedures and vaginal procedures. Both methods rely on supporting the bladder and urethra by securing the anterior vaginal wall or periurethral tissues by various means. An additional method is the placement of a sling to support the urethra directly.

Abdominal procedures for SUI were popularized by Marshall, Marchetti, and Kranz (MMK) in 1949.⁴ The performance of this procedure relies on the suturing of the periurethral and bladder tissues directly to the pubis and the anterior abdominal wall. Cure rates range from 57% to 98%, with follow-up of up to 20 years in some series.^{5,6} Complications of this procedure can include urinary retention believed secondary to urethral compression. Modifications of the procedure have been made to minimize injury to the urethral sphincter mechanism by placement of the periurethral sutures further away from these delicate structures. However, additional disadvantages remain, including the occurrence of osteitis pubis caused by sutures placed in the pubic periosteum, and the inability to correct a cystocele by this approach.

Further modification of the abdominal approach was made by Burch in 1961 who used Cooper's ligament as the overlying support structure.⁷ Furthermore, rather than securing the periurethral and bladder tissues directly, the Burch procedure uses the lateral aspect of the anterior vaginal wall alone as a support structure. This approach removes the risk of osteitis pubis and allows for the correction of small cystoceles. Cure rates range from 63% to 100%, with follow up of up to 14 years.⁵ By carrying the dissection along the lateral aspect of the bladder at the level of the bladder neck and trigone, there is an inherent risk of ureteral injury. Urinary retention may still result but reportedly at a lesser incidence than that of the MMK procedure.

Both of these procedures carry the morbidity of an open pelvic procedure, which includes an inherent degree of discomfort requiring narcotic analgesia and hospitalization. While this is easily warranted if other procedures are to be performed that require this method of exposure, alternative methods using the vaginal approach have been developed that minimize post-operative recovery demands. There are multiple variations on vaginally performed surgeries for genuine SUI. These all incorporate different techniques of dissection and their method of providing periurethral and bladder support.

The initial vaginal procedure was the Kelly plication of the pubocervical fascia

beneath the bladder neck as first performed in 1914.⁸ Initially developed for the repair of cystourethrocele, it has been found to benefit continence in about half of cases. The lack of a support mechanism other than the pubocervical fascia resulted in an overly high failure rate. Subsequent methods actually incorporate the suspension of the urethral support structures to the abdominal wall and adjoining structures.

The original Pereyra⁹ procedure was performed in 1959 with only a small suprapubic incision and without a vaginal incision. Number 30 stainless-steel wires were passed from the abdominal site lateral to the bladder neck and looped around to catch the anterior vaginal wall. The bladder neck and urethra are fixed to a high retropubic position. Multiple modifications have been made to this procedure, with a significant advance being made by Stamey in 1973 by introduction of cystoscopic control in the performance of the needle suspension.¹⁰ In addition, the Stamey procedure uses dacron bolsters buried beneath the vaginal mucosa to support the periurethral vaginal wall. While the passages of the needle are blind with the risk of bladder perforation, cystoscopic evaluation during the procedure helps verify the accurate placement of the nylon sutures used for support. While hospitalization is short due to minimal dissection and little disruption of anatomy, there is still the risk of dacron infection or erosion, along with the possibility of urinary retention from overzealous support of the urethra.

In 1981 and 1985 Raz presented additional modifications to the Pereyra technique to provide exact identification of the periurethral tissues by direct visualization and dissection.¹¹ Using the Raz technique, the periurethral support tissue is exposed and identified with subsequent fixation of this tissue using permanent suture to the anterior abdominal wall. This allows for accurate placement of the support sutures with minimal risk of bladder or urethral injury. In addition the bladder neck is completely dissected from any periurethral fibrosis allowing its accurate positioning without the requirement for undue tension. The sutures are passed through the pubocervical fascia and vaginal wall lateral to the bladder neck and passed through the abdominal wall following guidance of the needle by direct palpation through the space of Retzius. Although the initial approaches are different, the tissues used to support the bladder neck are similar in the Burch culposuspension. Success with this procedure is noted to be between 71% and 94%, with follow-up of up to 8 years.^{5,6} Bleeding can be encountered in the initial entering of the endopelvic fascia but can be controlled with

vaginal packing and with only the rare requirement for transfusion. Bladder injury may also occur, particularly if there is marked scarring from prior surgical or obstetrical interventions.

An additional procedure is the placement of a sling beneath the bladder neck that acts as a support mechanism.¹² In this manner there is less requirement for the repair to rely on the integrity of the periurethral tissues and vaginal wall. Since the sling procedure was introduced in 1942 by Aldridge, it has been performed using multiple materials, including abdominal wall fascia, fascia lata, MarlexTM and Gortex.TM The procedure is also useful for the poorly functioning urethra, classified as type III or intrinsic sphincter deficiency. By directly supporting the bladder neck the normal voiding mechanism, which is dependent on the funneling of the bladder neck, is altered. Patients require a period of voiding retraining to enable them to empty their bladder, with possible complications of bladder instability and urinary retention. As with all the procedures that carry the risk of acute postoperative urinary retention, a suprapubic tube may be placed at the time of the procedure to allow bladder emptying until adequate voiding is restored. Intermittent catheterization can be used as required.

An obvious benefit of the vaginal approach is the ability to treat other vaginal pathology such as cystocele, enterocele, or rectocele. Vaginal procedures typically also result in shorter hospitalizations of several days or less in comparison to the open approaches of the MMK or Burch methods. While it is difficult to draw exact comparisons between the various procedures due to a lack of matched patient populations and objective quantification of results, there may be greater long-term benefit with the open abdominal procedures. This can be explained due to the minimal dissection performed with some of the vaginal procedures, along with the reliance of fewer sutures for support. These factors may lead to inadequate securing of the bladder in the proper anatomic position. A potential solution to enabling the adequate dissection and fixation required for the long-term benefits found in the open procedures, with however decreased morbidity, is the performance of the Burch procedure under laparoscopic guidance.

The laparoscopic Burch culposuspension was first performed by Vancaillie and Schuessler in 1991.¹³ Originally performed trans-peritoneally, the most recent modification has been to perform the procedure via the extra-peritoneal approach. A balloon is passed from an umbilical incision and is used to dissect the retropubic space to

readily expose the bladder and urethra. With the passage of two additional trocars for instrumentation, the anterior vaginal wall supporting the bladder neck is readily exposed and supported to Cooper's ligament using multiple sutures. As with other laparoscopic procedures, the need for analgesia is minimal, and hospitalization amounts to an overnight stay. While too early to quantify the long-term results, initial findings have been favorable.

Summary

Genuine SUI is defined as that associated with hypermobility of the urethra and bladder neck. Accurate history-taking and physical examination allows for proper diagnoses and subsequent therapy in the majority of cases. Patients in whom bladder instability or intrinsic sphincteric deficiency are suspected may benefit from urodynamic testing. Regardless of method, all surgical procedures used to treat genuine SUI aim at supporting the bladder within the pelvic cavity. This allows for adequate compression of the urethra by those intra-abdominal forces that would otherwise only act to expel urine through a compromised outlet. The operation of choice should be determined by its ability to provide this

proper positioning over the long-term with the least morbid approach. Comparison of the various procedures is hampered by the lack of objective long-term data. For a vaginal approach, we prefer either the modified Pereyra as developed by Raz, or the placement of a sling beneath the bladder neck to provide firm, long-term support. For those patients who have not had prior abdominal surgery, the laparoscopic approach is an exciting method to obtain accurate dissection and fixation of the bladder neck and urethra. With careful evaluation and performance of these multiple techniques, therapy can be individualized for patients with excellent results.

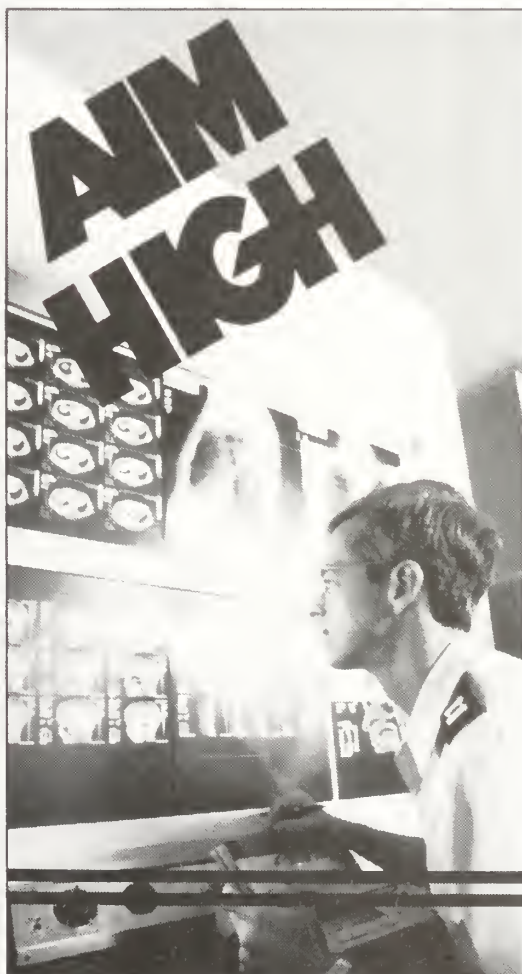
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Urinary Incontinence Following Prostatectomy

Brian S. McLeod, MD and Barry S. Stein, MD

Post-prostatectomy incontinence is a condition that is magnified when compared to other forms of incontinence, not only because of its sudden onset but because most of these patients have had previously normal urinary control. In light of the ramifications of the problem, we will explore current areas of diagnosis, prevention and treatment.

Incontinence can be defined fairly as the unexpected and unwanted loss of urine without control by the patient. Reviews of the literature reveal different definitions by different investigators, since the length of follow-up as well as bias on the part of the surgeon-evaluator can skew results. To be useful, a report should clearly define incontinence in terms of: 1) quantity/type of protection and number of pads used, and 2) type, the terms "urge," "stress," and "to-

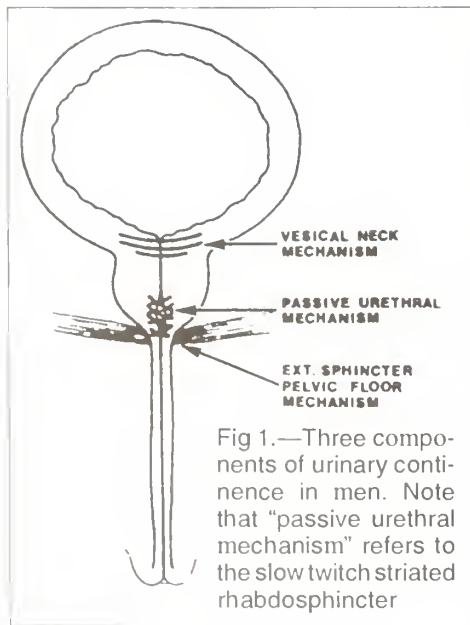


Fig 1.—Three components of urinary continence in men. Note that "passive urethral mechanism" refers to the slow twitch striated rhabdosphincter

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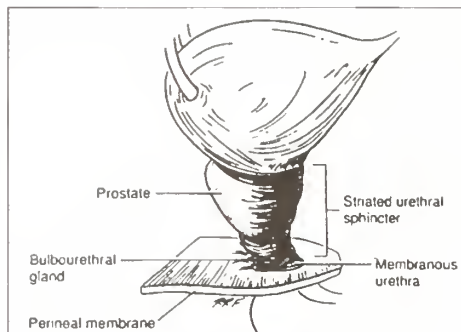


Fig 2.—Diagram of the location of the striated urethral sphincter.

tal."^{1,3}

In men, urinary continence depends on three components: the bladder neck or preprostatic urethra referred to as the internal sphincter, the prostatic and membranous urethral slow-twitch rhabdosphincter, and the voluntary pelvic floor musculature. The internal sphincter musculature is distinct from the detrusor proper. A complete circular collar exists around the bladder neck and extends distally to fuse into the prostatic capsule. Innervated primarily by adrenergic sympathetic fibers, this area is generally rendered incompetent after prostatectomy, and continence depends on the two remaining mechanisms. This area is also referred to as the proximal continence zone.¹

Passive urinary control is maintained by the distal prostatic and membranous urethra containing intra- and extramural layers of circularly oriented striated muscle fibers forming the rhabdosphincter. It is unique in that it is a slow-twitching (type I) striated muscle capable of sustained contraction and maintaining tone over time without fatigue. Smooth muscle of the urethra between the prostatic apex and urogenital diaphragm also contributes to the distal sphincter mechanism. The striated muscle varies in its circumferential extent and extends from the vesico-prostatic junction to the perineal membrane. It is a true sphincter, an integral part of the membranous urethra and does not arise from the ischiopubic rami. The circular fibers insert into a posterior midline tendinous raphe continuous with the anterior aspect of the perineal body. It more completely encompasses the urethra only

In men, urinary continence depends on three components: the bladder neck or preprostatic urethra referred to as the internal sphincter, the prostatic and membranous urethral slow-twitch rhabdosphincter, and the voluntary pelvic floor musculature.

between the prostatic apex near the verumontanum and the perineal membrane. (Figures 1–3).^{1,3} Innervation is primarily by somatic branches emanating from sacral segments S2-S3 near the origin of the pudendal nerve above the ischial spine which then courses near the pelvic plexus to reach their destination (Figure 4).²

The external sphincter or the pelvic floor musculature plays a minimal role in the maintenance of passive continence. Because

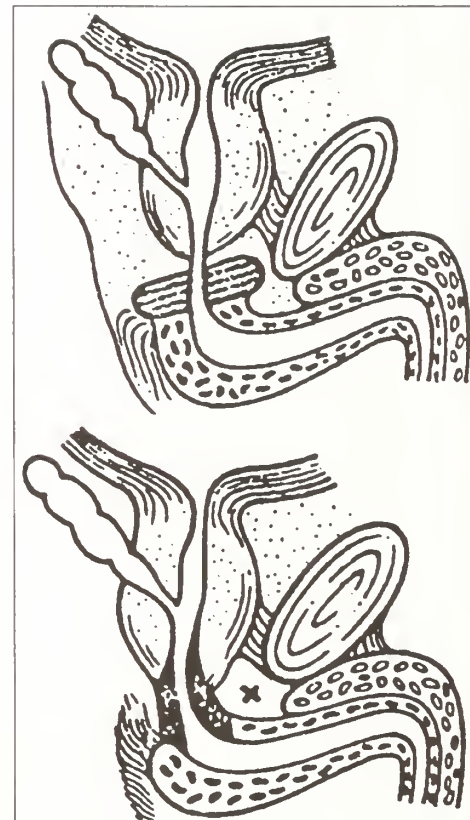


Fig 3.—Top figure illustrates the traditional inaccurate depiction of the distal sphincter mechanism while the bottom diagram shows the more accurate picture where this distal sphincter mechanism extends from inside the prostatic urethra distally in a continuum.

ABBREVIATIONS USED

FDA: Food and Drug Administration
PTFE: Polytetrafluoroethylene
RRP: Retropubic prostatectomy
SPP: Suprapubic prostatectomy
TURP: Transurethral prostatectomy

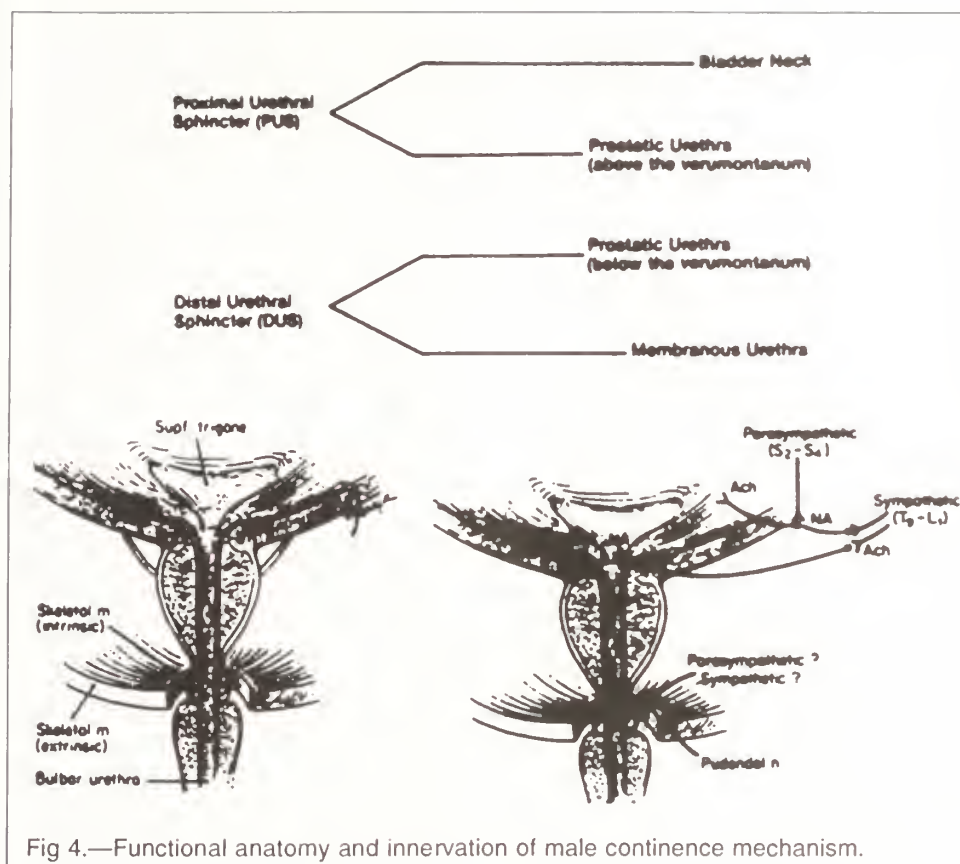


Fig 4.—Functional anatomy and innervation of male continence mechanism.

it is composed of fast-twitch voluntary striated muscle fibers that easily fatigue, it can only temporarily interrupt the urinary stream. It may, however, be important in the maintenance of continence with sudden increases in intra-abdominal pressure.^{1,3}

Although iatrogenic injury to the sphincter area is the most obvious etiology of post-prostatectomy incontinence, continued or new obstructions such as unresected adenoma, bladder neck contracture or a developing urethral stricture can cause overflow incontinence. Bladder disorders such as a decompensated bladder due to dementia, cerebrovascular accident, myasthenia gravis or Parkinson's disease can be significant factors. Malignant infiltration of the sphincter, urinary tract infection, or pharmacologic agents can worsen the situation.¹

Incontinence Following Prostatectomy for Benign Disease

In an otherwise normal man, the risk of incontinence is low after transurethral prostatectomy with generally quoted rates of 0.5 to 1.0%. The greatest risk factor for incontinence in a series by Staskin and associates was a lack of voluntary sphincter control, when present there was an 83% risk. Following TURP, Anderson and associates have found a mean decrease in functional urethral length of 2 cm. Due to the slowly progressive, chronic nature of bladder out-

let obstruction secondary to benign prostatic hypertrophy, bladder dysfunction is of major significance. In a study by Kahn, 49% of patients had detrusor instability as the sole cause of incontinence and, in another 25%, it was a co-existing contributing factor. Turner-Warwick demonstrated that the true distal extent of the lateral lobe adenoma is beyond the proximal extent of the distal sphincter mechanism. This causes difficulty with apical lobe resection requiring use of the 0 degree beakless lens/resectoscope. Overall, TURP is associated with a very low risk of incontinence and remains the gold standard of treatment of bladder outlet obstruction.^{1,3}

In a prospective randomized trial comparing suprapubic prostatectomy (SPP) to TURP there was no significant difference noted in the incontinence rate. Minimizing incontinence post-SPP is done by avoiding finger-breaking the distal urethra while enucleating. One way to preserve the distal sphincter mechanism is to extend the transpubic incision into the lumen of the urethra and transect the urethra inside the lateral lobes at the level of the veru prior to enucleation.¹

Incontinence Following Prostatectomy for Cancer

Traditionally, the highest rate of postoperative incontinence occurs after radical retropubic prostatectomy (RRP). Due to the

definition discrepancies, there is a wide range for total incontinence, from 0 to 12.5%. There is a median rate quoted for severe incontinence of 5% and for mild to moderate stress incontinence of 27.4%. There does not seem to be a difference in continence rate with a history of previous TURP, age differences or local stage of cancer. RRP performed after radiation therapy, so-called "salvage prostatectomy" is associated with an increased rate of incontinence. This is due to radiation inducing fibrotic and parietic changes in the external sphincter mechanism additionally compromised by surgery.^{1,4}

Various investigators have attempted to decrease the chances of incontinence employing modified vest suture techniques versus primary urethral-vesical anastomosis. Also studied have been techniques such as membranous urethroplasty, avoidance of sutures into the external sphincter, partial pubectomy to aid in visualization, transection above the distal extent of capsule, vesical neck retubularization and changing the suture material itself. All have their advocates and detractors. Of interest, Myers et al. studied operative and cadaveric specimens and found two distinct prostatic configurations. One group of patients had a prostatic notch that was present when the anterior commissure did not extend distally as far as the apex of the prostate. In this case, a portion of urethra and distal sphincter mechanism exists proximal to the prostatic apex. The other group without a prostatic notch had an anterior commissure that extended to the apex and the urethral margin and a significant amount of sphincter was then not proximal to the apex. The more distal sphincter mechanism may be preserved by being cognizant of the anatomy and attempting to transect the urethra at its earliest exit from the prostate.⁴

Evaluation of Post-Prostatectomy Incontinence

History, including the quantity and type of urinary loss, is a useful starting point in diagnosis and evaluation of these patients. Physical examination can determine bladder distention consistent with overflow incontinence. High post-void residual may be due to persisting outlet obstruction or underreactive detrusor muscle. Neurologic examination of the perineum and lower extremities, including deep tendon reflexes, Babinski reflex, and sensation, should be checked routinely. Weak or absent sphincter tone, abnormal voluntary contraction, or an absent bulbocavernosus reflex signifies a neurologic cause of voiding dysfunction. Cystourethroscopy can dem-

onstrate stricture, bladder neck contracture, residual adenoma, and gross abnormalities. Video-urodynamic studies evaluate the anatomy and pathology most accurately. The distal sphincter should be closed during filling and open during voiding. Sphincter dysfunction may be diagnosed accurately by inability to close the external sphincter voluntarily using provocative maneuvers. With a full bladder, the presence or absence of stress incontinence can be ascertained. This is followed by a measurement of post-void residual and uroflow studies. A low flow can be due to bladder outlet obstruction or an underactive detrusor contraction. Compliance, capacity, and abnormal contractions can be assessed with a cystometro-gram. A bladder contraction of greater than 15 cm of water (less if symptomatic) is a significant indicator of detrusor instability. Pressure-flow studies can be performed to measure detrusor pressure with voiding in order to differentiate bladder outlet obstruction from detrusor contraction abnormalities. Of limited utility is the use of urethral pressure profiles. Although they can measure length of continence area and closing pressures, they are prone to artifacts. Some investigators have found a reduced urethral length to usually less than 2 cm and a closing pressure of less than or equal to 5 cm to be associated with higher rates of incontinence.^{1,3}

Treatment

As previously mentioned, when post-prostatectomy incontinence is felt to be due to distal sphincter dysfunction, it is recommended to wait at least a year before initiating surgical treatment. A voiding diary can be a helpful guide in evaluation.

Bladder instability can be treated initially with anticholinergic drugs such as oxybutynin (Di-tropan) 5 mg bid-qid, propantheline (Pro-Banthine) 15-30 mg qid, hyoscyamine (Levsin) .125-.25 mg q 4 hours, Levsinex .125-.25 mg q 8-12 hours or flavoxate (Urispas) 100 mg q 6-8 hours. Imipramine, a tricyclic antidepressant, up to 75 mg tid is useful due to its combined anticholinergic and alpha adrenergic properties. Sphincter tone can be augmented by the use of alpha adrenergic agonists such as phenylpropanolamine or phenylephrine, which are combined in Entex 1 tablet qid.¹

Non-pharmacologic methods such as the use of Kegel or pelvic floor exercises and biofeedback may speed recovery and improvement in continence. In some studies, urge and stress incontinence improved by about 75% in post-TURP and about 60% post-SPP patients. Patients with continual leakage and post-RRP responded poorly with 17% to 33% improvement. Electrical

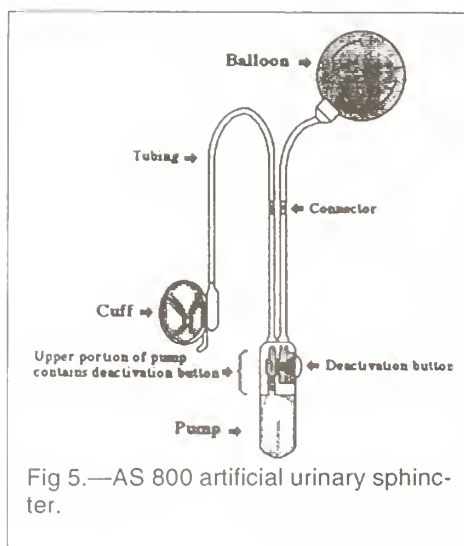


Fig 5.—AS 800 artificial urinary sphincter.

stimulation in various ways has been useful in mild incontinence, but these devices appear to stimulate the fast-twitch fibers of the pelvic floor and not the slow-twitch fibers of the distal sphincteric mechanism. All studies are generally marked by differing study populations and non-standardized evaluation.^{1,3}

The use of external collection devices such as the condom catheter also have a role in management. The Cunningham clamp and similar compression devices placed around the penile urethra are helpful as long as minimum pressure is used.¹

The artificial urinary sphincter was first developed in the early 1970s and appears to have withstood the test of time.

One of the first procedures for post-prostatectomy incontinence was the use of bladder neck reconstruction. Varying degrees of success have been reported. Detractors believe that this approach is too complicated and is directed at the wrong anatomic site. Other approaches such as the Kaufman Prosthesis compress the bulbar urethra and has met with varying success rates and continues to be refined. The artificial urinary sphincter was first developed in the early 1970s and appears to have withstood the test of time. The AMS 800 consists of a pressure regulating balloon reservoir, an occlusive cuff, and a control pump. The cuff is placed around the bulbous urethra and preset cuff pressures are delivered from 51-60 to 81-90 cm H₂O (Figure 5). The control device is implanted in the scrotum, and the reservoir in the sub-fascial area of the pubis. Urodynamic evaluation is required pre-operatively to detect hyperreflexia. In addition to those with detrusor instability, poor candidates include those

with anatomic abnormalities, decreased compliance, and those with small functional bladder capacity. Occasionally bladder augmentation is required prior to placement. Continence rates greater than 90% have been reported. Complications include cuff or balloon leaks, urethral erosion or atrophy, and infection. These problems are encountered less often with continuing mechanical refinement of the device.^{1,3}

Periurethral injection therapy has been used since the 1960s. The first agent widely used was polytetrafluoroethylene (PTFE, or Teflon) and has also had use in enlargement of the vocal cords. This injectable paste resulted in post-TURP continence rates of 85%, post-SPP rates of 80%, and 48% continence in the post-RRP patients. Multiple injections are usually required. The problems encountered include "leaking out" of paste from injected area, insufficient use of paste, and injection of the incorrect area. There also has been some concern over migration of the particles to the central nervous system. Recently approved by the FDA is bovine cross-linked collagen, Contigen (Bard). Used mainly as a hemostatic agent in the past, it is easier to inject compared to Teflon, is a naturally occurring substance, and evokes less of a fibrotic reaction. Early clinical trials have been quite favorable.⁵

The evaluation and treatment of post-prostatectomy incontinence has undergone major improvements. With better understanding of the underlying pathophysiology, its incidence will likely decrease. Continued advances in treatment will improve the quality of life in properly selected patients.

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Incontinence in the Elderly

David S. Greer, MD

Urinary incontinence (UI) is defined as the involuntary loss of urine sufficient in amount or frequency to be a social or hygienic problem. It is a common and troublesome problem particularly among the elderly. Its occurrence has been estimated as between 8% to 34% in community-dwelling elderly and over 50% in those who are homebound or have dementia. In the nursing home population, the prevalence is usually in the 60% to 70% range. The cost of caring for these patients ranges around \$3 billion per year in the nursing home population and \$5 billion dollars per year in the community-dwelling group. These figures are not precise, but the problem is obviously large.

Urinary incontinence does not usually connote a fatal disease, but the morbidity is substantial. Besides discomfort, embarrassment, dependency and social isolation, it may be accompanied by depression, skin breakdown or urinary tract infection, and it can lead to falls and fractures as patients hurry to toileting accommodations. In association with other problems, it contributes to institutionalization.

Pathophysiology

The lower urinary tract consists of a vessel (the bladder) and a narrow aperture for emptying (the urethra). These structures are under neuromuscular control, both involuntary and voluntary, with neurological connections extending through the spinal cord to the brain stem and cerebral cortex. Incontinence results from either structural abnormalities of the vessel or its outflow channel, or from abnormal dynamics secondary to muscular or neurological problems. This simplified concept of the mechanism of urinary outflow and control can be helpful in understanding the incontinence syndromes and their treatment.

Normally the bladder and its muscle, the detrusor, are distensible without much increase in bladder pressure as urine volume increases; resting urethral pressure is maintained at levels higher than bladder pressure to prevent urinary leakage. As the bladder distends, proprioceptive receptors in its wall

send signals to the detrusor muscle nucleus of the pons through the spinal cord. Conscious control of urination emanates from a collection of neurons in the frontal lobe that inhibit the pontine center. Urination results when the signals from the bladder are sufficient to provoke discharge of motor impulses from the pons through the spinal cord to the detrusor, and inhibition from the cerebral cortex is terminated. The detrusor contracts, and the urethral sphincter simultaneously relaxes. The detrusor is innervated by cholinergic neurons and the urethra is primarily controlled by the alpha-adrenergic system. This innervation is the basis for much of the pharmacologic therapy of UI.

Signs of congestive heart failure and pedal venous insufficiency combined with a history of nocturnal incontinence may make the diagnosis of fluid mobilization incontinence.

External anatomical elements also have an impact on urination. In men, the prostate surrounds the urethra and may become obstructive as it enlarges with age or disease. In normal women, the proximal third of the urethra is normally intra-abdominal; during activities that increase abdominal pressure, like coughing, external pressure on the urethra rises concomitantly with bladder pressure to assist in the maintenance of continence. In addition, the mucosa of the female urethra is estrogen-dependent; normal mucosal thickness provides resistance to urine flow. Finally, of particular relevance to the elderly, environmental and personal factors may be critical to the maintenance of continence: adequate mobility and dexterity to rearrange clothing and use a toilet, adequate cognitive function to recognize toileting needs and find an appropriate facility, and absence of environmental barriers such as inaccessible toilets.

Clinical Classification of Incontinence

Reversible Urinary Incontinence

There are acute and reversible forms of UI. These generally result from diseases or other factors not directly associated with genitourinary pathology or frequently, they are the side effects of medication. A mnemonic (DIAPPEARS) has been found useful in recalling these problems:

A urinary diary is often helpful in delineating the pattern of incontinence and may suggest etiologic factors.

D- Delirium

I- Infections

A- Atrophic vaginitis

P- Psychological (depression, psychosomatic)

P- Pharmaceutical agents

E- Endocrine conditions (especially diabetes mellitus)

R- Restricted mobility (including environmental barriers)

S- Stool impaction

Some use the term "functional incontinence" to include all patients with UI in the presence of normal bladder and urethral function, encompassing environmental as well as physical and cognitive problems.

Persistent Forms of Incontinence

It is helpful to think of the origins of UI in terms of the underlying pathophysiology. The causes of UI may be anatomic, muscular or neurological.

1. Anatomic

In the male, enlargement of the prostate can cause obstruction of the bladder outlet, distention of the bladder and overflow incontinence. Detrusor instability may accompany this syndrome, leading to involuntary bladder contractions. In the female, pelvic muscle weakness and laxity may lead to cystocele and/or prolapse, sometimes termed a hypermobile urethra. The proximal urethra becomes extra-abdominal and is not compressed on occasions of increased abdominal pressure (eg, cough), leading to stress incontinence. Infections of the bladder or urethra may cause abnormalities and irritation of the mucosa and precipitate incontinence.

2. Muscular

In various circumstances, often unexplained, the detrusor muscle may become unstable and contract sporadically. Urethral sphincter weakness is a second cause of muscular UI.

3. Neurological

The bladder may become acontractile due to neurologic disease; diabetic neuropathy is probably the most common cause.

ABBREVIATIONS USED

BUN: Blood urea nitrogen

UI: Urinary incontinence

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Medications may produce similar neurological impairment.

Detrusor hyperactivity is sometimes associated with upper motor neuron disease, such as stroke and Parkinson's disease; increased bladder muscle tone may then exceed urethral closure pressures and produce incontinence. Finally, diseases of the higher centers of the central nervous system, such as dementia and depression, may impair the cognitive suppression of urination. Psychological factors such as hostility, anger and lack of motivation may have similar effects.

Pharmacological therapy may be of help in the treatment of stress incontinence but should be used cautiously in the elderly; the benefits are modest and the side effects can be devastating.

These pathophysiologic mechanisms lead to four basic syndromes:

1. Stress incontinence—loss of urine simultaneously with increases in abdominal pressure (eg, cough). Stress incontinence usually results in the loss of small amounts of urine and is most commonly caused by pelvic floor laxity or sphincter weakness.

2. Urge incontinence—precipitant urge to void with urine loss while attempting to get to a toilet. Urge incontinence is usually characterized by an inability to delay voiding when the urge to urinate is perceived. Its most common causes are detrusor instability, which may be idiopathic or secondary to bladder irritation, eg, infection or stones, and detrusor hyperactivity associated with upper motor neuron lesions, eg, stroke.

3. Overflow incontinence—sporadic loss of urine without a sense of bladder fullness. Overflow incontinence is leakage in the presence of an unperceived overdistended bladder. It is caused by obstruction of the outlet, eg, prostatic hyperplasia or urethral stricture, or by hypocontractility of the detrusor secondary to neuropathy, eg, diabetes, Vitamin B₁₂ deficiency.

4. Functional incontinence—UI predominantly related to factors outside the lower urinary tract. These may be physical, cognitive, psychological or due to environmental barriers.

UI due to medication should be considered regardless of the type of incontinence. The worst offenders are diuretics, adrenergics and anticholinergics, calcium channel blockers, psychotropics and analgesics. One must also always consider alcoholism, which is often a hidden problem among the elderly.

Diagnosis

History

There are key symptoms in the history that often lead to the correct diagnosis.

1. Loss of small amounts of urine when coughing, sneezing or laughing is stress incontinence by definition; loss of large amounts should create suspicion of an additional factor.
2. The patient who "almost makes it" has urge incontinence if overflow is eliminated by the presence of a normal residual urine.
3. Straining, hesitancy, and slow or incomplete emptying is most frequently associated with overflow incontinence, either obstructive or atonic.
4. A history of prolonged bed rest or recent surgery should raise the suspicion of overflow incontinence.
5. Strictly nocturnal incontinence suggests fluid reabsorption with recumbence, as in congestive heart failure or venous insufficiency with edema. Bedtime drinking may be a factor.
6. Decline in mobility, reduction in self-care ability and symptoms of depression are important historical elements suggestive of functional incontinence.
7. A history of diabetes or anemia raises the likelihood of overflow incontinence (atonic bladder).
8. A history of recent medication change suggests iatrogenic incontinence. Medication should be suspect in all circumstances.
9. Dysuria or hematuria connote infection, stones or tumors, which may cause detrusor instability.

A urinary diary is often helpful in delineating the pattern of incontinence and may suggest etiologic factors.

Physical Examination

The physical examination is often helpful in making a correct diagnosis. A palpable bladder after urination is associated with overflow incontinence. In women, a bimanual pelvic examination is essential, not only to detect bladder enlargement but also to check for obstructing masses, pelvic weakness (cystocele, rectocele, prolapse), and to examine the vulva and vaginal mucosa for atrophy. The state of the vaginal mucosa in post-menopausal women reflects the state of the urethra because they are both estrogen-dependent.

Rectal examination may reveal fecal impaction or, in the male, prostatic hypertrophy; weak anal sphincter tone suggests a similar problem with the urethral sphincter.

The neurological examination is important, particularly reflex hyperactivity in the

lower extremities that may correlate with detrusor hyperactivity, and impaired perineal sensation (pin-prick and touch) suggesting sensory deficit in the bladder.

Signs of congestive heart failure and pedal venous insufficiency combined with a history of nocturnal incontinence may make the diagnosis of fluid mobilization incontinence.

Laboratory

An extensive laboratory work-up is unnecessary in the initial evaluation of incontinence. A clean catch or catheterized urine specimen is essential to check for glycosuria, pyuria, hematuria and bacteriuria; a culture should generally be done. A BUN, blood glucose, serum calcium, hemoglobin and hematocrit are sufficient to complete the work-up.

An initial cystometric examination can be done in the examining room. It should begin with the patient's bladder comfortably full. In the supine position, the patient is asked to cough to observe leakage of urine; if no leakage is detected, the process is repeated with the patient standing. The patient is then told to void; the time taken to empty the bladder and the urine volume are noted (normal flow rate 10-15 ml/sec., normal volume over 300 ml). The patient is then catheterized and the residual urine volume measured (normal less than 100 ml; greater than 100 ml residual generally makes the diagnosis of overflow incontinence). The catheterized urine may be used for analysis and culture.

A history of recent medication change suggests iatrogenic incontinence.

In the great majority of cases, these history, physical examination and laboratory examinations will lead to a relatively secure presumptive diagnosis. If the diagnosis is still in doubt, referral for more intensive investigation is indicated. There are numerous radiological and functional tests available to the appropriate specialists but these may have limited value in elderly patients, particularly those who are frail or who suffer from other chronic diseases. The dictum *primum non nocere* should be kept in mind when considering referral.

Treatment

Therapy is based on the symptom complexes and associated pathophysiologic mechanisms outlined above. First, one must address any reversible, extra-urinary factors that may be contributing to the problem. Discontinuing all medications that are not life-preserving is often a good way to

start; medication-induced iatrogenic disease is rampant in the elderly. Infection should, of course, be treated. Treatment of asymptomatic bacteriuria is also warranted since the elimination of bacteria from the urine has been associated with improvement in incontinence without symptoms of infection. Depression, delirium and other central nervous system problems may be reversible. Diabetic control may improve a neuropathy. The factors leading to impaired access to toilet facilities, both personal and environmental, are too often neglected in the development of a therapeutic plan; simple measures like a bedside commode or ambulatory assistive devices may be more effective than pharmaceuticals. The DIAPERS mnemonic is a good check-list to assure that potentially reversible conditions are adequately addressed.

Stress incontinence may require pelvic reconstructive surgery but that should not be the first option. In recent years, many observers have found physiotherapy (pelvic floor or Kegel exercises) combined with behavioral therapy (habit training) to be quite effective. Pelvic floor exercises are taught by having the patient interrupt voiding to get a sense of the muscles being used or by having women squeeze the examiner's finger during pelvic examination without doing a Valsalva maneuver. The exercises consist of repetitive contractions of these pelvic floor muscles 10 to 20 times, 5 to 10 times each day. Various biofeedback devices have been developed to assist patients with pelvic floor exercises but their efficacy in geriatric patients has been questioned and they probably complicate the process unnecessarily. Habit training consists of scheduled or prompted voiding to maintain a small bladder volume.

Pharmacological therapy may be of help in the treatment of stress incontinence but should be used cautiously in the elderly; the benefits are modest and the side effects can

be devastating. Conjugated estrogens, 0.3–0.625 mg daily may improve urethral tone. Alpha-adrenergic agonists are used to facilitate urethral sphincter function: phenylpropanolamine (Ornade) 75 mg two or three times daily or pseudoephedrine (Sudafed) 15–30 mg three times daily are the most commonly used. Imipramine (Tofranil) 25–50 mg twice or three times daily has both anti-cholinergic and alpha-adrenergic properties and may relax the bladder musculature while tightening the urethral sphincter.

Urge incontinence is frequently improved by bladder training and scheduled toileting. Pharmacologic therapy with anticholinergic or antispasmodic drugs may be used to reduce the excessive and often unpredictable detrusor activity that commonly causes the problem. Oxybutynin (Ditropan) has become the agent of choice in many clinics, at a reduced dose of 2.5–5.0 mg twice or three times daily. Flavoxate (Urispas) 100–200 mg two or three times a day is also commonly used. Older agents include Propantheline (Pro-Banthine) and Dicyclomine (Bentyl) but these have greater side effects. Imipramine (Tofranil) may also be useful, for the reasons noted above.

Overflow incontinence must first be addressed by surgical correction of any existent outflow obstruction. Cholinergic therapy, Bethanecol (Urecholine) 10–30 mg two or three times daily has been used to improve the detrusor function of atonic bladders but is of limited efficacy. Alpha-adrenergic antagonist therapy, eg, Prazosin (Minipress) to relax the urethral sphincter and facilitate emptying may reduce the frequency of incontinence. Cognitively intact and functionally competent patients may do best with intermittent self-catheterization to avoid bladder over-distention. Finasteride (Proscar) has shown some promise in reducing the size of enlarged prostates but its effect on residual urine volume is questionable. Males may find self-catheterization

difficult.

In functional incontinence, if no reversible etiology is present, supportive measures are often the best one can offer. A large variety of assistive devices are available: external collection devices, clamps, absorbent pads and panties, etc. External environmental modification should not be neglected. In cases where a psychological component is significant, behavioral therapy may be helpful.

A word should be said about the use of chronic indwelling catheters. The complications of chronic catheterization are manifold: urinary tract infection is unavoidable, regardless of the precautions taken. Catheter care is time-consuming and requires both educated, alert patients and competent attendants. Numerous studies have shown that chronic catheterization is overused in institutionalized patients. Alternative methods of treatment of irreversible incontinence are preferable, available, and often successful.

Conclusion

Incontinence in the elderly frequently is a treatable condition. Treatment is based on knowledge of a few anatomic and pathophysiologic principles. The diagnostic work-up in the majority of cases is well within the capability of the non-specialist. Pessimism is unwarranted. The prognosis may be better than the common wisdom would have us believe.

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Guest Editor:

William J. Waters, PhD

Incontinence in Children

Randy M. Rockney, MD, and
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Enuresis is the involuntary voiding of urine beyond the age at which control of voiding is normally attained, usually expected by age 4 to 6 years or "school age." Most urinary incontinence that occurs in children can be defined as some form of enuresis, with anatomic or pathophysiologic etiologies being less common. Primary enuresis is defined as wetting that occurs in children who never had control; whereas secondary enuresis is the situation in which the child had a consistent period of dryness (3 to 6 months) preceding the onset of the wetting, 20% to 25% of cases. Fifteen to 20% of enuretics have diurnal enuresis. Sixty percent of them stop wetting during the day before nighttime wetting stops.¹⁻³

Enuresis occurs in 10% to 20% of 5-year-olds with boys outnumbering girls at all ages, by a 3-2 ratio. Forsythe and Redmond showed that the annual spontaneous cure rate between 5 and 9 years was 14%,⁴ increasing to 16% between 10 and 19 years.

Etiology

Enuresis represents a symptom and not a specific disease entity. It follows, therefore, that there is no single explanation that fits all cases, and it is possible that more than one etiology may be operational in any individual case. Several theories have been proposed to explain enuresis: developmental delay, psychological factors/stress, genetic factors, sleep disorder, and structural and functional urinary tract abnormalities.

Developmental Delay: The most commonly accepted theory of nocturnal enuresis is a developmental delay or maturational arrest in attaining central control of bladder function. Urodynamic findings of a reduced functional bladder capacity along with an increase in diurnal and nocturnal uninhibited bladder contractions tend to support this theory. Also, nocturnal enuresis often is seen in association with other patterns of developmental delay such as delayed bowel sphincter control along with delays in walking and talking.⁵

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Psychological Factors/Stress: Enuretics usually do not suffer from significant psychological disorders, although emotional disturbances have been found to be slightly higher in this population.⁶ Children with enuresis may suffer from lowered self-esteem as a secondary effect of the chronic stress that derives from enuresis. Anyone who has worked with enuretic children and teenagers can attest to the positive feelings of both the patient and the family when significant improvement has occurred.

Genetic Factors: Often, other family members have enuresis. Bakwin demonstrated that, compared to a 15% incidence of enuresis in children from nonenuretic families, 44% and 77% of children were enuretic when one or both parents, respectively, were enuretic.^{7,8} Conversely, approximately a third of fathers and a fifth of mothers of enuretic children were themselves enuretic as children. Apparently a positive family history does not influence the spontaneous resolution rate.

Sleep Disorder: Parents often describe their enuretic child as an extremely sound sleeper. This may be more apparent than real in that they are unlikely to attempt to awaken their nonenuretic children, and it has been concluded that enuretics and nonenuretics do not differ appreciably in their sleep pattern.^{9,10}

Anatomic and Pathophysiologic Etiologies of Urinary Incontinence: There are three categories of anatomical causes of urinary incontinence: (1) extravesical urinary drainage; (2) bladder dysfunction resulting from obstruction or neurologic impairment; or (3) reduced sphincter neurologic or anatomic tone.

Extravesical urinary drainage occurs when one or both ureters are ectopic in relationship to the bladder. This anomaly presents more commonly in females than males due to the fact that the ectopic ureter is more likely to drain distal to the urinary sphincter system. The most common symptom, therefore, would be continuous urinary leakage in spite of a normal voiding pattern. This also may be observed by examining the perineum of a little girl and actually seeing a dimple with urinary drainage or continuous leakage from a site other than the urethral meatus.

Bladder dysfunction resulting from outlet obstruction or neurologic disease is gen-

... the low incidence of underlying anatomical lesions does not warrant radiographic or cystoscopic evaluation in most instances.

erally in the form of hypertonicity. This is caused by trabeculation of the detrusor muscle, which leaves the bladder hyperactive. The opposite may occur, though rare in children, in that the outlet obstruction over longer periods of time may result in an atonic type of bladder that would empty quite poorly and result possibly in overflow incontinence. Examples include boys with posterior urethral valves, girls with outlet obstruction from a prolapsed ureterocele or a cecoureterocele, boys with an anterior urethral diverticulum, or, rarely, boys with obstruction from a large Cowper's duct cyst.

Neurologic impairment of the bladder or sphincter mechanism also may result in hypertonicity of the bladder and present with urinary incontinence. This is often seen in lower motor neuron types of lesions. Among children, it is most commonly found in the myelomeningocele patient where a mixed pattern of hypertonicity and low urethral resistance is seen.

Assessment

A parent of an enuretic child often say that they are in your office "just to make sure everything is okay." It is important to them that an underlying anatomical abnormality is not overlooked. It was not many years ago that an extensive radiographic and cystoscopic evaluation of enuretics was undertaken for just that purpose. Well-documented studies indicate, however, that the low incidence of underlying anatomical lesions does not warrant radiographic or cystoscopic evaluation in most instances.^{4,11}

Assessment begins with an extensive history, focusing on the symptom itself with particular attention to any red flags that might suggest the necessity for a more in-depth evaluation involving radiographic or urodynamic studies (Table 1).

History: At the first appointment everything relating to the symptom of urinary incontinence is discussed. Does the patient have primary or secondary incontinence? Does the wetting occur during the day, during the night, or anytime? What is the

ABBREVIATIONS USED

ADH: Anti-diuretic hormone
DDAVP: Desmopressin acetate
IVP: Intravenous pyelography
UTI: Urinary tract infection

wetting frequency? Has the symptom improved or remained unchanged? Is there a history of a previous urinary tract infection or other symptoms like urinary hesitancy that are referable to the urinary tract? Does the child or teenager sleep in his own bed or have his own room? While not essential to diagnosis, this question may be important when therapeutic options are discussed.

Table 1.—“Red Flags” in the Patient History

Past history of uropathology
Daytime incontinence - significant
Family history of uropathology
Dribbling
Continuous wetting
UTIs

Incontinence, polyuria, and polydipsia should make one suspicious of diabetes mellitus or diabetes insipidus. Upper airway obstruction, too, may be related to the symptom of enuresis.

It is crucial to inquire about the presence of constipation or encopresis. Of the first 125 patients presenting to our enuresis clinic, 18% were also encopretic. Aggressive management of the constipation or encopresis may cure the wetting problem and is essential in the management. The physician must be alert to, and question the possibility of, any previous or ongoing inappropriate sexual contact. And, finally, the patient and his or her family should be questioned about any previous evaluation and attempts at therapy. Many children may have been treated with conditioning therapies like the enuresis alarm at an earlier age. This is important information because an assessment by a physician may not have been performed. Also the therapy may have been undertaken at a younger age when the child's motivation to eliminate the symptom was inadequate for the success of conditioning therapy. In like manner, previous attempts at pharmacotherapy may have involved doses that were too small or trials on medications that were too brief or not well monitored.

Physical Examination: A thorough physical examination of the patient with urinary incontinence is essential to uncover findings that may have a bearing on diagnostic or therapeutic decision making. It can also be reassuring to the patient and the parents.

A mental status exam is important to determine the level of intellectual functioning and the motivation to work toward a cure and to detect any evidence of psychopathology. It is important, too, to assess the patient's interactions with parents or caretakers. The patient's psychosocial milieu is an important determinant of the likelihood of follow-through with diagnostic proce-

dures and compliance with therapy.

The abdomen should be examined for the presence of masses such as a distended bladder or, more often, a non-tender sausage-shaped mass in the left lower quadrant that results from fecal impaction of the descended colon and rectum. An anal and rectal examination is then necessary to assess perianal sensation, sphincter tone, and the degree of fecal impaction in the rectum. The genitalia should be examined to assess the size and position of the urethral meatus and to observe for any evidence of infection. An examination of the back might reveal the presence of a sacral dimple or another clue of the presence of vertebral or spinal cord anomaly. A thorough neurologic examination helps to reassure everyone that there is no subtle neurologic dysfunction to account for the symptom.

Finally, voiding should be witnessed. In the adolescent or young adult this is understandably a sensitive procedure and should, if at all possible, be done by someone of the same sex as the patient. Observation should be made of the force and directionality of the urinary stream. In females, the seating position on the toilet should be noted as vaginal reflux with subsequent post-void wetting may occur if the female sits too far forward on the toilet seat (Table 2).

Diagnostic Evaluations: Urinalysis should be performed on all patients. A urine specific gravity greater than 1.020 will rule out a concentrating defect and diabetes insipidus. The absence of glucosuria is helpful to rule out diabetes mellitus. Urine culture, too, should be performed. Bacteriuria is known to increase wetting frequency and is common in girls.

Although urographic evaluation of the enuretic patient is controversial, few argue against the need for urographic studies in the child with a history of a urinary tract infection or symptoms of abnormal or dysfunctional voiding. Of late, too, there has been a trend toward using ultrasonography and voiding cystourethrography as the initial radiographic assessments, reserving IVP for those patients who demonstrate an abnormality on either of the first two evaluations.¹²

Treatment

Accepted treatment falls into two large categories: behavior modification and pharmacotherapy. That is not to say that all enuretics require treatment. Many parents, once reassured that an underlying structural problem is unlikely, do not request treatment or are unwilling to accept the risks or inconveniences associated with treatment.

The age at which enuresis is treated, again, should be individualized. Certainly

if daytime symptoms are significant one may elect to treat at a relatively younger age. However, it is usually not necessary to consider treatment for the pure nighttime enuretic before 6 to 7 years of age. A reasonable guide is that treatment should be initiated when the child is significantly bothered by the symptom to become motivated enough to pursue a treatment plan. One should not be guided solely by the level of concern or motivation of the parents.

Especially important in dealing with a bedwetter is that the child and parents be counseled on the etiology and natural history of enuresis. Enuretics must be reassured that they are not being lazy or misbehaving and that this symptom rarely indicates a serious disease. They should be informed of the "high incidence" of bedwetting in their age group and be reassured by knowledge of the spontaneous cure rate.

Behavior Modification: Behavior modification has demonstrated some success in selected cases. It calls for significant cooperation and, therefore, motivation by the patient. These techniques include timed voidings, positive reinforcement, bladder retention training, and conditioning therapy. Behavior modification techniques may be used alone or with other therapy.

Table 2.—“Red Flags” in the Physical Examination/Urinalysis

Neurologic abnormality
Spinal anomaly (sacral dimple)
Palpable bladder post void
Decreased urinary concentrating ability
Proteinuria/hematuria/pyuria

Management of Daytime Enuresis: In the absence of an underlying anatomical abnormality, the majority of daytime incontinence occurs in children with uninhibited bladder contractions or children who have a reduced signal to bladder filling and may in addition have an inability to centrally suppress a detrusor reflex. Often these children will have no warning of a full bladder and will squat or use some other mechanism to tighten their perineal musculature to prevent wetting. This can be managed by instituting a more frequent voiding schedule before wetting episodes caused by uninhibited contractions due to a full bladder. A timed voiding schedule coupled with a motivational overlay is most effective.

Positive Reinforcement Therapy: Any reinforcement therapy requires a cooperative, motivated patient and a concerned physician who is able to develop a good rapport with the patient. The child maintains a progress record ("star chart") with a sequential reward system established for longer and longer dry intervals. In this way,

the child assumes both the responsibility for wetting and the credit for dryness. The cure rate with motivational therapy is thought to be about 25% with an 80% improvement rate.¹³ While improvement appears to be slower than with other treatment modalities, fewer than 5% relapse.¹⁴

Bladder Retention Training: The finding of a reduced functional bladder capacity in many enuretics has prompted attempts to increase bladder capacity in treating enuretics. Various regimens involve forcing fluids (with or without diuretics), interrupting the urinary stream, lengthening the interval between daytime voidings, and recording the volumes of daytime voids.¹⁵ While it does follow that functional bladder capacity improves with the spontaneous cure of enuresis, therapies such as bladder conditioning or anticholinergic medications have not been successful in pure nocturnal enuresis.¹⁶⁻¹⁸

Conditioning Therapy: This system consists of a battery-operated alarm with either a pad or electrodes. When the pad or electrodes become wet, the alarm is triggered, awakening the child and, thus, interrupting urination. The child is then instructed to arise and go to the bathroom to complete voiding. The theory underlying this technique is that the triggered alarm results in inhibition of micturition, which, when it happens repeatedly following the initiation of normal reflex voiding, results in inhibition of those factors responsible for triggering reflex voiding.¹⁷

The alarm system reportedly affords the best cure rates of bedwetters. Overall success rate approaches 70% with relapses expected in 30% of responders. A repeat course of treatment has been shown to be effective in many relapsers. The length of treatment is rather long, as a mean period of 16 to 17 weeks is required for response,^{19,20} with a significant drop-out rate.

Pharmacotherapy

Drug therapy includes agents that decrease output, anticholinergics to increase bladder capacity or reduce uninhibited contraction, and tricyclic antidepressants.

Agents Decreasing Urinary Output: Attempts at decreasing urinary output by limiting fluid intake or producing relative nocturnal dehydration by the use of daytime diuretics usually are unsuccessful. However, there is some evidence that the normal diurnal variation in antidiuretic hormone (ADH) levels may be altered in some enuretic patients.^{21,22} This results in increased output at night that exceeds functional bladder capacity resulting in bedwetting. Desmopressin acetate (DDAVP), a synthetic analog of the natural antidiuretic hormone,

arginine vasopressin, can be used. Given intranasally at bedtime, it has a duration of action from 6 to 24 hours.²³ Success rates have been reported in up to 75% of patients. Adverse effects reported have included transient headache, epistaxis, nostril pain, conjunctivitis, nasal congestion, rhinitis, chills, dizziness, nausea and abdominal pain. Water intoxication and convulsions have been reported, and the manufacturer recommends periodic serum electrolyte determinations.

Anticholinergic Agents: Unsuccessful in treating pure nocturnal enuresis, despite their ability to increase functional bladder capacity, anticholinergic agents do have a role in patients with demonstrable uninhibited contractions or other urodynamic abnormalities. These patients may be suspected if there is a history of daytime incontinence, urgency, or frequency.

Tricyclic Antidepressants: Imipramine (Tofranil) has been the most common frequently used medication for the treatment of nocturnal enuresis. The success of imipramine varies among series, but a positive response can be expected in at least 50% of patients, of whom 60% relapse.²⁴⁻²⁷ The dosage range is 0.9 to 1.5 mg/kg/dose, which usually computes to 25 mg for children 5 to 8 and 50 mg to 75 mg for older children.

The timing of administration is generally at bedtime, although some children who consistently wet shortly after bedtime may benefit from an earlier administration.²⁸ Once a response has been achieved, an arbitrary decision is made to discontinue treatment after 3 to 6 months. The mechanism of action of imipramine on enuresis remains unclear. Imipramine has direct effects on the bladder, albeit a rather weak anticholinergic activity, along with an α -adrenergic effect and a β -receptor enhancement.

Is medical evaluation and treatment of benefit to enuretics in view of the mostly self-limiting nature of enuresis and the annual spontaneous cure rate? Several studies indicated that there is strong evidence for the benefit of treatment with regard to both behavior and resolution of the symptom. As there is no one theory to explain the etiology of enuresis, no one therapy is universally successful. Once the child and family circumstances are fully evaluated, an individualized treatment plan should be proposed.

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Assisting Your Patient with Intractable Urinary Incontinence: Absorbent Products and Devices

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Although these products are often available without prescription, health care providers can still perform a valuable service in assisting patients with their selection and use.

While the goal of therapy for many patients with urinary incontinence is the elimination of the problem, intractable cases nevertheless arise. For these patients, a vast array of incontinence products exists that can be a potential source of both confusion and expense. A survey of several major manufacturers of these items reveals the availability of at least 100 types of absorbent pads, undergarments, diapers, and liners alone.¹ These materials typically are not covered by third-party reimbursement plans and therefore may represent a significant portion of a patient's medical budget. Furthermore, patients often are embarrassed by their condition, which impedes their ability to seek the necessary information. Although these products are often available without prescription, health care providers can still perform a valuable service in assisting patients with their selection and use.

The purpose of this article is to provide local caregivers with a partial summary of available products along with the necessary information to properly assist their patients (Table 1). This guide is not meant to be all inclusive, and any omissions are non-intentional. It is our hope that by performing this service, we may aid in the prevention of those problems that can arise from urinary incontinence. These problems include the social stigma of urinary leakage, along with the associated soiling and resultant odor of clothing, bedding, and furniture. Furthermore, appropriate management can prevent potential medical complications ranging from skin breakdown to urosepsis.² With incontinence being a major factor in the decision to institutionalize many patients, appropriate use of such products may pro-

mote the continuation of their care in the home or community setting. Benefits from such measures could extend into minimizing health care costs, where in the US more than \$10.3 billion is spent annually on the management of urinary incontinence.³

Absorbent Pads and Undergarments

For the patient plagued with persistent incontinence, the initial choice is usually those products meant to absorb urine. While we are all familiar with diapers, there is in fact an entire array of absorbent liners and pads that may also be applicable. While advertising has made the public more familiar with them, the ads have not necessarily lessened the confusion in choosing the most appropriate product. These items can be selected based on the volume of urinary leakage, although one must also consider the relative comfort and ease of use of individual products. The spectrum of products ranges from very light, super absorbent liners for mild to moderate leakage, to large adult diapers, for severe incontinence. Package information is often available that identifies the effective absorbent capacity.

For mild to moderate loss of bladder control, there are shields or pads designed to be placed directly inside underwear. The public is familiar with these products through advertisements, but they may not be ideal for those individuals with more severe incontinence, without the requirement for multiple pads and frequent changing. For individuals suffering moderate to heavy loss of bladder control, several companies have manufactured gender-designed cotton/polyester underwear. These undergarments generally have a pouch discreetly sewn inside to hold a superabsorbent disposable liner. The liners, with a capacity of up to 300 cc, are ecologically safe, and many are flushable. Absorbent undergarments of varying size and absorbency provide protection for many levels of both bladder and bowel management.

The more debilitating forms of urinary incontinence may require the use of adult diapers. Appropriate product selection for this group of individuals can affect their self-esteem and custodial care significant-

ly. Experience has shown that patients who require ongoing hygienic care can be maintained in diapers 24 hours a day without skin damage if vigilance is practiced to minimize infection and urine burn.² While the continued use of adult disposable incontinence products can be costly, some insurance companies may lend assistance if provided with a doctor's prescription. These items often can be bought in bulk and be delivered. Most local retailers are eager to work closely with patients. Given the financial constraints, choice between more costly disposable products versus the laundering of reusable items may also enter the decision process.

Clamps and Pessaries

For those men who do not wish to use absorbent products, urethral compression devices have been available for many years. Worn about the penis, they compress the urethra to prevent the egress of any urine, and are unclashed for voiding. Since they may cause discomfort and injury, appropriate candidates are those patients who require only mild compression to remain continent. These typically are patients who have normal bladder capacity and compliance and do not have severe urge incontinence with the generation of bladder contractions of high pressure. Because these patients are candidates for other methods of therapy such as placement of an artificial urinary sphincter or the use of injectable materials, the use of these devices is becoming less frequent.

The potential for penile injury is significant, including penile skin maceration, penile edema, and urethral injury. Therefore candidates should have penile sensation and the ability to easily manipulate the clamp. Use of these devices on patients with altered mental status, diminished sensation, or who are reliant on others for their care is to be discouraged. Bladder awareness should also be present, but if diminished, can be managed by voiding on a timed regimen. Proper teaching and follow-up are essential

ABBREVIATIONS USED
HIP: Help for Incontinent People

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with the use of these devices.

In females, a pessary, or incontinence ring, may be used. These devices support and occlude the bladder neck for continence and are also used to support the uterus in cases of prolapse. Manufactured in a variety of shapes, sizes, and rigidity, they should be fitted individually. As with penile compression devices, these patients should have normal bladder capacity and compliance and not have severe urge incontinence with the generation of bladder contractions of high pressure. By definition, these patients also are candidates for surgical correction of their condition, and a pessary is typically chosen due to advanced age or debility.

While some women require removal of the pessary for each act of voiding, many void with the device in place. Pessaries should be removed and cared for on a routine basis, and patients are best selected who have the requisite cognitive and motor function to do so. Patients who are unable to comply require routine office care and evaluation. Complications from pessary use include vaginal and bladder infection, along with the potential for erosion through the vagina into adjacent structures. Very often in this population there is limited understanding of the anatomy and care of the genital area; close follow-up and supervision is required.

External Collection Devices

While attempts have been made to develop external collection devices for both sexes, success has been achieved primarily among males. These devices may be used for patients regardless of the severity of incontinence. They are divided into the two categories of leak-proof versus loose-fitting.

The leak-proof variety is the condom catheter, which seals around the penis, aided either by adhesives or an inflatable ring. Patients may be ambulatory or confined to bed, since leakage should not occur despite patient positioning. The condom catheter would require reapplication if removed for actual voiding or the use of intermittent catheterization, so it often is left in place to provide total drainage of all urine. Drainage may be to a large collection bag for prolonged use, or to a smaller "leg" bag that would require more frequent emptying. Both types of drainage bags can be cleansed with equal parts of white vinegar and water.

Complications of penile and urethral injury from condom catheters are similar to that of the penile clamp. These can arise due to a tight-fitting appliance that would compromise penile blood flow and lymphatic drainage or overzealous application and

Table 1.—Incontinence Products		
Product	Indication	Manufacturer/ Brand Name
Absorbants		
Pads & Shields	Male/Female: for mild to moderate incontinence.	17–25
Undergarments	Male/Female: for moderate to heavy incontinence.	17–23,25
Liners	Gender specific briefs with liner insert: For moderate to heavy incontinence.	19–21,24,25
External Collection Devices		
Pouch	Male (ambulatory): for post void drip or mild to moderate incontinence.	4,12,15
External Condom Catheters	Male (bedridden or ambulatory): for moderate to severe incontinence.	1,2,4,5,7,10,12–14
Compression Devices		
Penile Clamps	Male: occlude urethra, release for urination.	2,27,28
Pessaries	Female: support uterus and bladder.	
Catheters		
Intermittent	Male/Female: for periodic emptying of bladder.	1–3,5–7,11–14
Indwelling	Male/Female: for continuous urinary drainage	1–3,5,9,11,11,16
Skin Care Products		
Cleansers/Creams/Moisture Barrier Ointments	Antimicrobial to control and prevent skin breakdown.	3,8,13,17,20,26
Manufacturers/Brand Name Key:		
1 Baxter, 2 Bard, 3 Rusch, 4 Hollister, 5 Rochester, 6 Kendall, 7 MMG, 8 Urocare, 9 Dow Corning Wright, 10 Sierra, 11 Seamless, 12 Coloplast, 13 Mentar, 14 Intermed, 15 Convatec/Squibb, 16 Davol/Bardia, 17 Attends, 18 Curity, 19 Depends/Kimberly Clark, 20 Dignity/Humanicare, 21 Surety, 22 Tranquility, 23 At Ease, 24 Serenity/Johnson & Johnson, 25 Secure/G.Hirsch & Co., 26 Care-Tech, 27 Baumrucker, 28 Cook.		

removal of adhesives. Patients wearing external collection devices should be properly trained in their application, with the condom snug enough to remain in place, but not so tight as to constrict blood flow. Patients who lack penile sensation or the functional ability for self care should be closely followed.

The use of loose-fitting external collection devices has fewer risks of penile injury, but they are reliant on dependent drainage to function. Therefore, they are used for men who are ambulatory. A harness holds the collection device over the penis, which allows the urine to drain into a dependent bag.

Both types of external collection devices require a penis of adequate length to permit fitting, without retraction into the lower abdominal pannus. Circumcision is usually not required, but is considered if foreskin edema develops from prolonged use. Penile prostheses can be placed to provide penile

length and rigidity to assist in the application the condom catheters.⁴

Catheters

Catheters may be used by both sexes for either intermittent or chronic drainage of the bladder. Intermittent catheterization can be performed by either the patient or care giver, and is employed predominately in cases where the patient is unable to empty the bladder completely. This may lead to urinary stasis and overflow incontinence; intermittent placement of the catheter has been found to be a safe and effective method of bladder drainage.⁵ This is performed at set time intervals, depending on the individual patient's bladder capacity and his/her ability to empty the bladder at all. Typically bladder volumes are kept below 500 ml to avoid further ischemic injury to the bladder from overdistension. In contrast to hospital regimens that use sterile preparation, home use can be performed with clean

technique alone. Complete drainage of the bladder allows for the clearance of any admitted host bacteria, and infection is not typical. Catheters can be cleaned and reused providing the material does not breakdown. If repeated infection develops, then nightly antimicrobial prophylaxis can be employed, and consideration for modifications of technique can be considered. Various single lumen catheters have been designed regarding material, caliber, and length, with obvious considerations given to age, gender, and the presence of latex allergy. Patients are provided with careful instruction and support to best promote safe technique and subsequent compliance. With proper technique, urethral injury is rare, and comfortable use can be performed routinely.

Indwelling catheters are reserved for those patients who cannot employ other methods of caring for urinary leakage, or in whom bladder drainage cannot be performed by intermittent catheterization. Catheters should be changed at least monthly since debris may clog the lumen, calcium salts may precipitate on the catheter, and the material can break down with prolonged urine exposure. Lumen size should be adequate for non-obstructed bladder drainage. Overly generous calibers can cause poor drainage of urethral and prostatic secretions in men, along with chronic urethral dilation with further incontinence in women. In men, the risk of prostatic and urethral infections can be offset by placement of the catheter suprapubically, which is also changed on a monthly regimen once the catheter tract through the abdominal wall is well formed. Latex catheters tend to cause the greatest amount of tissue reaction, with Silastic or silicone catheters being more biocompatible. Despite advances in material, all indwelling catheters lead to concomitant bacterial colonization of the bladder, and place the patient at risk for urosepsis along with malignant degeneration of the urothelium.⁶

Skin Care

The skin in the perineal area is more likely to become irritated when moist with urine. If the skin comes in prolonged contact with urine, it may become excessively soft and swollen, which can lead to breakdown in the epidermal layer. Irritating urine salts can then cause subsequent discomfort, rashes, and infection. Thus, good perineal skin care is imperative for incontinent patients, and care should be taken to keep skin

Table 2.—Incontinence Informational Groups		
The Simon Foundation	PO Box 815 Wilmette, IL 60091	800-23-SIMON
Alzheimer's Disease And Other Related Disorders Association	360 N Michigan Ave. Chicago, IL 60148	312-853-3060 800-621-0379
Continence Restored, Inc.	407 Strawberry Hill Stamford, CT 06905	203-348-0601
HIP (Help For Incontinent People)	P.O. Box 544 Union, SC 29379	803-579-7900 800-BLADDER

dry and cleansed properly after urinary leakage.

There are many quality antimicrobial cleansing and skin care products available for the control and prevention of skin breakdown and infection related to incontinence. These include cleansers, creams, and moisture barrier ointments, which remove chemical irritants naturally found in urine and provide an artificial barrier to prevent skin inflammation and rawness. Incontinence associated odors can also be quite offensive to care givers and demoralizing to patients. Several manufacturers of skin care products offer deodorizers that effectively eliminate unpleasant smells.

Support Groups

A number groups exist to help patients (Table 2) by providing emotional support, medical and equipment information, physician referrals, and by funding research endeavors. Contact was made with over half the available incontinence manufacturers listed in the H.I.P. (Help for Incontinent People) manual supplied by that organization. Within weeks a plethora of information, brochures, products, and representatives deluged our office. Given such volume, it comes as no surprise that patients and care givers can be left confused, embarrassed, and feeling ignorant as to the most effective products for individual needs. Thankfully, there are many establishments throughout Rhode Island that employ com-

passionate individuals who welcome the opportunity to assist patients in finding the incontinence product that fits their individual personal and financial needs. Table 3 consists of only a partial list of local firms. Indeed, most state a willingness to order any of the hundreds of incontinence products on the market even though particular items may not be in their current inventory.

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Table 3.—Local Vendors		
AAA Surgical Supply	436 Atwells Avenue, Providence, RI	274-1110
Delta Home Care	1512 Smith Street, N. Providence, RI	353-4110
United Surgical Center	380 Warwick Avenue, Warwick, RI	781-2166
Moshassuck Pharmacy	1 Randall Square, Providence, RI	351-5900
Pawtuxet Valley Prescription & Surgical Center	59 Sandy Bottom Road Coventry, RI	821-5000
Douglas Drug Stores	All Locations (See Pharmacist)	—
Brooks Drug Stores	All Locations (See Pharmacist)	—



Public Health Briefings

Rhode Island Department of Health
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Preventing Childhood Lead Poisoning: Doing Better but Feeling Worse

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The Rhode Island Lead Poisoning Prevention Act of 1991 revolutionized our approach to childhood lead poisoning in the state. We are screening more children, doing it better, and eliminating lead hazards more aggressively than ever before. It is not surprising that the number of children identified annually with blood lead levels ≥ 10 ug/dl has quadrupled. The number of children identified with significant lead poisoning (blood lead ≥ 25 ug/dl) has also increased. Despite our best efforts, childhood lead poisoning remains the number one environmental health problem in Rhode Island; and children will continue to experience lead poisoning in epidemic proportions for some time.

The Problem

The past use of leaded paints in older, deteriorating housing stock has created a serious exposure risk for children. Peeling paint, house dust, and soil may be highly contaminated with lead. Drinking water may be contaminated from lead pipes or solder, as well. Children in low-income families often live in housing with significant lead hazards. Compounding the problem, these children may be poorly nourished. Empty stomachs and diets poor in iron and calcium enhance lead absorption. Figure 1 clearly demonstrates higher rates of childhood lead poisoning in older urban communities around the state. Positive screening results are highest in Providence, Central Falls, and Woonsocket. Rates in Burrillville, Pawtucket, West Warwick, Westerly, Jamestown

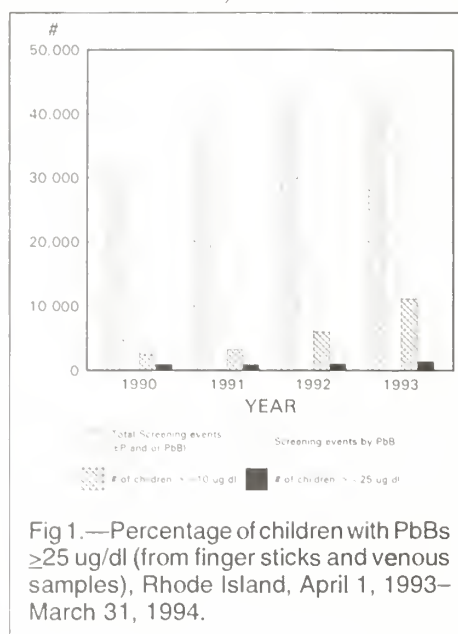


Fig 1.—Percentage of children with PbBs ≥ 25 ug/dl (from finger sticks and venous samples), Rhode Island, April 1, 1993–March 31, 1994.

Island, and Little Compton are also high.

A Screening Strategy that Works

Experience has demonstrated the importance of a three-pronged screening strategy. First, the majority of children are screened by health care providers in private and HMO practices. Second, children from low-income families who receive regular health care or WIC nutritional supplements are screened at community health centers and WIC sites. Third, many children from high-risk communities who do not receive routine health care are screened at home. The door-to-door program reaches children who

are not accessible at health care or WIC sites.

Table 1 demonstrates the importance of each source of screening. The door-to-door campaign yields the lowest number of screenings annually, but the highest proportion of blood lead (PbB) levels >25 ug/dl (15% in 1993–1994). More than half the children reached in the door-to-door campaign had not been screened in the preceding year. Screenings at community health centers and WIC sites yield almost half the children with PbBs >25 ug/dl annually (723/1598 in 1993–1994). The greatest total number of children is screened annually by health care providers in private and HMO practices. Although these children are the least likely of the three groups to display PbBs >25 ug/dl, the number of children in this range (486 in 1993–1994) actually exceeds the number found by the door-to-door campaign. In sum, children from low-income families are most likely to display significant lead poisoning, but all children from all backgrounds are at risk; therefore, *all pediatric providers must be vigilant and participate in screening.*

A Screening Test that Works

Until recently, most screenings for lead poisoning in Rhode Island used the Free Erythrocyte Protoporphyrin (FEP) test. Although the FEP is inexpensive and reliably identifies PbBs ≥ 35 ug/dl, it is not very sensitive for PbBs at lower levels. Overall, it missed two or three PbBs ≥ 10 ug/dl for every one detected. In 1992 the RI Department of Health Laboratory began using a direct test for PbB, and by March 1993 was using it for all blood samples. Not surpris-

Table 1.—Screening results for Rhode Island (4/1/93 to 3/31/94) by provider type

Provider type	Children Screened	Blood Lead Levels	
		≥ 10 ug/dl (%)	≥ 25 ug/dl (%)
Health Centers & WIC Sites	11,993	4986 (42%)	723 (6%)
Door-to-Door	2,538	1734 (68%)	389 (15%)
Program Private/HMOs	23,454	5106 (22%)	486 (2%)
Total	37,985	11,826 (31%)	1598 (4%)

ABBREVIATIONS USED

FEP: Free erythrocyte porphyrin test
HMO: Health maintenance organization
PbB: Blood lead
WIC: Women, Infants and Children program

Table 2.—RI Department of Health blood lead screening guidelines**Recommended Screening Intervals^a**

Risk Level/ Age (Months)	Previous PbB Level		
	<10 ug/dl	10–14 ug/dl	≥15 ug/dl
High Risk^b			
6–36	6 months	3–4 months ^c	3–4 months
37–72	12 months	12 months	3–4 months
Low Risk^b			
9–36	12 months	3–4 months ^c	3–4 months
37–72	——may discontinue—— ^d		3–4 months

^a Symptomatic children are inappropriate candidates for screening; immediate diagnostic test recommended.

^b Based on environmental questionnaire

^c Switch to annual screening after either:

—> 2 consecutive screening results < 10 ug/dl, or

—> 3 consecutive screening results < 15 ug/dl.

^d Provided all screening ≤15 ug/dl before 36 months of age and no change in environmental conditions

ingly, the number of children detected annually with PbBs ≥10 ug/dl quadrupled between 1991 and 1993, revealing the true magnitude of Rhode Island's childhood lead poisoning epidemic (Figure 2).

Screening Guidelines

Most children under age 6 should be screened for PbB at intervals no greater than 12 months, with shorter screening intervals for children who live in high-risk environments and for children with previous PbBs ≥10 ug/dl (Table 2). A brief questionnaire is available from the RI Department of Health for evaluating environmental risk. In any circumstance, symptomatic children are inappropriate candidates for screening; immediate diagnostic testing is recommended. Screening may be discontinued after 36 months of age at the discretion of the provider if the child has been screened according to guidelines until that age, no PbBs have exceeded 15 ug/dl, and no changes in environmental conditions have occurred. Screening is recommended after 72 months of age only for developmentally delayed children.

Medical Management of Childhood Lead Poisoning

The medical management of childhood lead poisoning has three essential components, including diagnosis and possible chelation, dietary manipulation, and environmental management:

Diagnosis and possible chelation: Children with positive screening results have venous blood drawn and tested for PbB. Symptoms of lead poisoning are checked and evaluated. PbBs ≥45 ug/dl indicate the need for chelation. PbBs ≥25 ug/dl and <45 ug/dl may indicate a need for chelation in young infants and toddlers. Frankly, the latter is a judgment call. We have yet to see

the benefit of chelation for PbBs <45 ug/dl.

Dietary manipulation: Children are put on a diet low in fats and high in protein, iron, and calcium. Full stomachs slow the absorption of lead compounds. Iron and calcium compete with lead compounds for absorption sites.

Environmental management: Children are removed from high-risk residential environments and the environments are made lead safe. *It is essential to remove children from high risk residential environments if they are undergoing chelation therapy. Chelating agents may promote the absorption of lead compounds if the latter continue to be ingested.*

The Importance of Environmental Intervention

Environmental intervention is key to the medical management of lead poisoning. The RI Lead Poisoning Prevention Act of 1991 mandates aggressive pursuit of environmental lead inspections and abatement. The health department conducts comprehensive environmental lead inspections in the homes of children with significant lead poisoning, prioritized by blood lead level. Last year, the department's two inspection teams conducted more than 1500 inspections in more than 250 homes, looking for lead exposures from damaged lead-based paint, dust, soil, and drinking water. Landlords and homeowners are responsible for making timely repairs or face prosecution in Housing Court.

As explained above, the need for environmental intervention is particularly critical for families with children who undergo chelation therapy. It is dangerous for children to be discharged to a high-risk environment during or immediately following chelation. Equally dangerous is permitting young children to live in a home undergo-

ing renovations or other lead hazard reduction work. Once department inspectors have completed inspections, families of poisoned children are usually faced with a housing crisis; temporary relocation is essential during abatement but affordable alternatives often are not available. For children undergoing chelation therapy, health department inspectors typically assess four alternatives before finding minimally acceptable temporary housing. In some cases, shelters may provide the only alternative to prolonged hospitalization.

Not all families regard the health department's inspections as a service. About 6% of families with lead poisoned children initially refuse entry to their home, fearing eviction, rent increases or governmental intrusion. In these cases, primary providers are asked to intervene with the family. Failing successful intervention at this level, social service referrals are made for the family's medical negligence. Thus far, all cases have been resolved.

New programs to train, license and regulate the private market for lead inspections and abatement are now in place. Homeowners who avail themselves of these services may receive up to \$1000 in Rhode Island tax credits. Information on other financing programs is available through local area housing offices.

For questions concerning lead screening or the medical management of lead poisoned children, contact the health department's Childhood Lead Program at 277-1185, extension 145. For questions concerning environmental management or intervention, contact the health department's Environmental Lead Program at 277-1417.

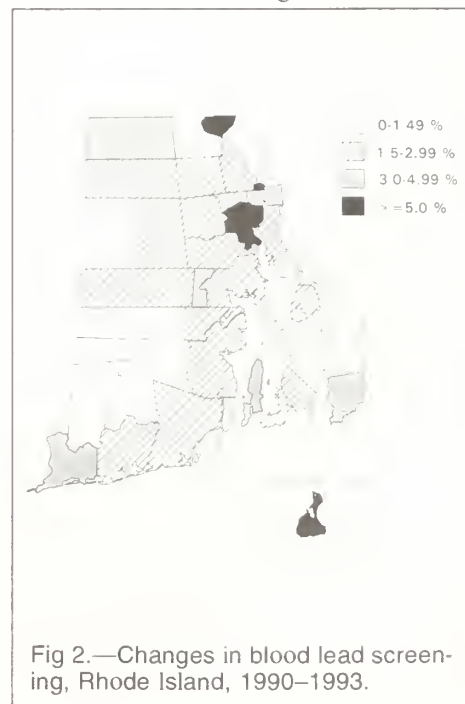
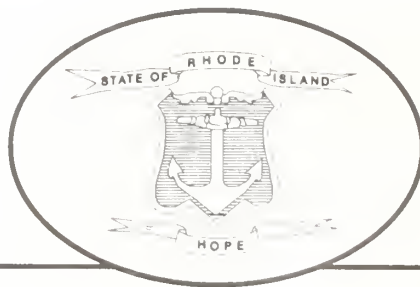


Fig 2.—Changes in blood lead screening, Rhode Island, 1990–1993.



Work, Mobility, and Self-Care Disability In Rhode Island

Changes brought about by the Americans with Disabilities Act and growing concern about the impacts of injury and chronic disease are two factors that have focused attention on the prevalence of disability. Measures used to assess disability vary. One approach is to measure the prevalence of activity limitation: from 1985 Rhode Island Health Interview Survey data it has been estimated that 15.3% of Rhode Islanders had some degree of activity limitation;¹ for 11.5% of respondents the limitation was in a major activity.

More specific measures of disability in Rhode Island are available from the 1990 United States Census data for the state, based on the "long form" completed by a sample of all respondents. Non-institutionalized respondents were asked whether, due to a physical, mental or other health condition lasting 6 months or more, they were either limited in performing or unable to perform work (a work disability). They were also asked if, due to such a chronic condition, they had any difficulty leaving the home alone (a mobility disability) or taking care of personal needs such as dressing, bathing, eating, etc. (a self-care disability).

From these data it is estimated that 8.6% of Rhode Islanders ages 16-64 have a work disability, or roughly 55,000 people (Figure 1).² National figures suggest that about half of those with a work disability are prevented from working; the other half are limited in the kind or amount of work they do. The data do not indicate what proportion of

these people are prevented from working due to accessibility problems in the work place, rather than due to the impairment itself. The state rate, which is unchanged from the 1980 figure, is slightly higher than the US rate of 8.2%.

The 1990 data indicate that roughly 35,000 adults had a mobility disability.³ Many of them were older Rhode Islanders: the prevalence of this disability was 2.1% for those ages 16-64, and 14.3% for those age 65 and up. Similarly, a disproportionate number of the estimated 37,000 Rhode Islanders with a self-care disability are older: among those ages 16-64 the rate was 3.0%, compared to 11.5% for those over 64.⁴ Except for the mobility disability rate among older Rhode Islanders, which is somewhat lower than the US rate of 15.6%, the local rates look very much like the national rate (Figure 1).

Causes of activity limitation include injury and developmental disability, responsible for much of the disability in young people, and chronic diseases which predominate in older people with disability. In general, conditions that are less disabling are more prevalent than highly disabling conditions. Low prevalence injuries and conditions can be very costly, however, because they often occur early in life and can lead to many person-years of disability. By one measure, it is estimated that 35% of disability-years are accounted for by those whose disabling condition began by age 15.⁴

Nationally, the three conditions most

frequently cited as the main causes of activity limitation are orthopedic impairments, arthritis, and heart disease. The three conditions most often cited as the main cause of work disability (Figure 2) are back or spine problems, heart trouble, and arthritis or rheumatism.⁵ Of these conditions, however, only orthopedic impairments occur in the top ten when conditions are ranked by the proportion of those affected who need help with basic life activities.

As part of its surveillance activities, the Disabilities Prevention Program will be monitoring progress toward the state's health objective for the Year 2000 that calls for a decrease from 11.5% to 10% in the prevalence of major activity limitation in Rhode Island. Achieving this objective will be a challenge, given the wide variety of conditions and circumstances that contribute to disability, and the range of age groups affected.

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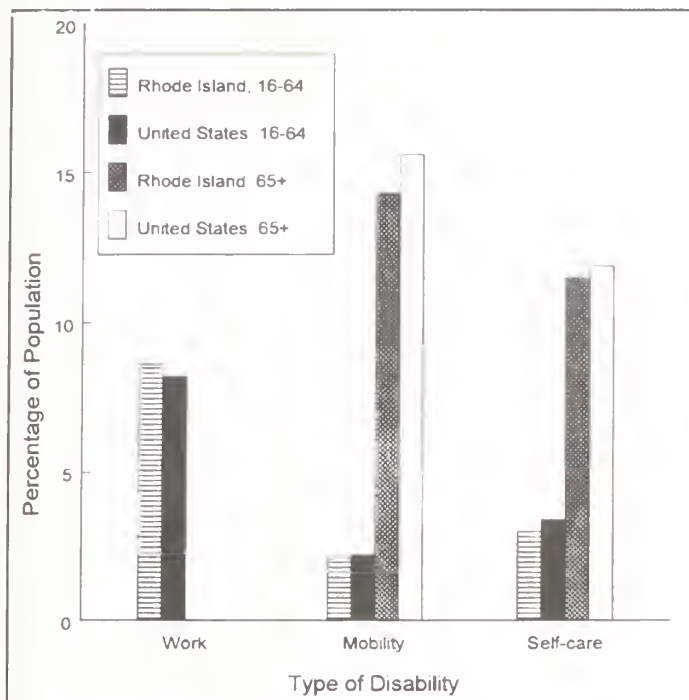


Fig 1.—Prevalence of work, mobility, and self-care disability, Rhode Island and United States (1990)

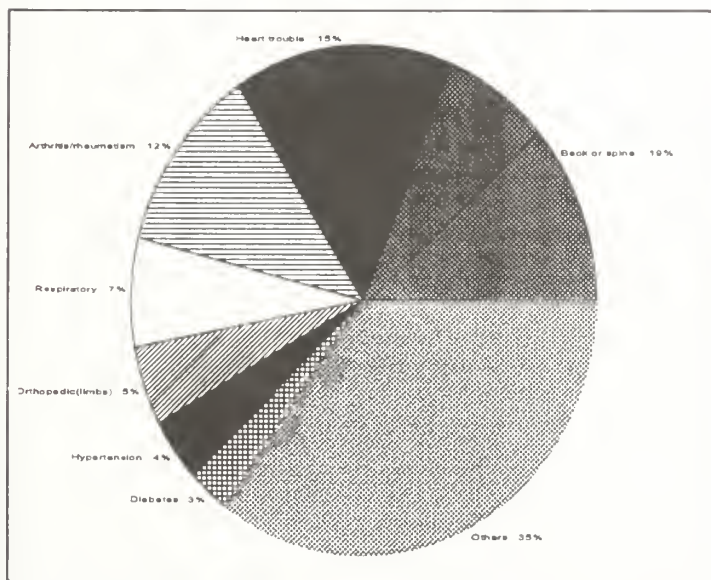


Fig 2.—Conditions most often cited as the main cause of work disability among persons ages 16 to 72.

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References:

1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
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4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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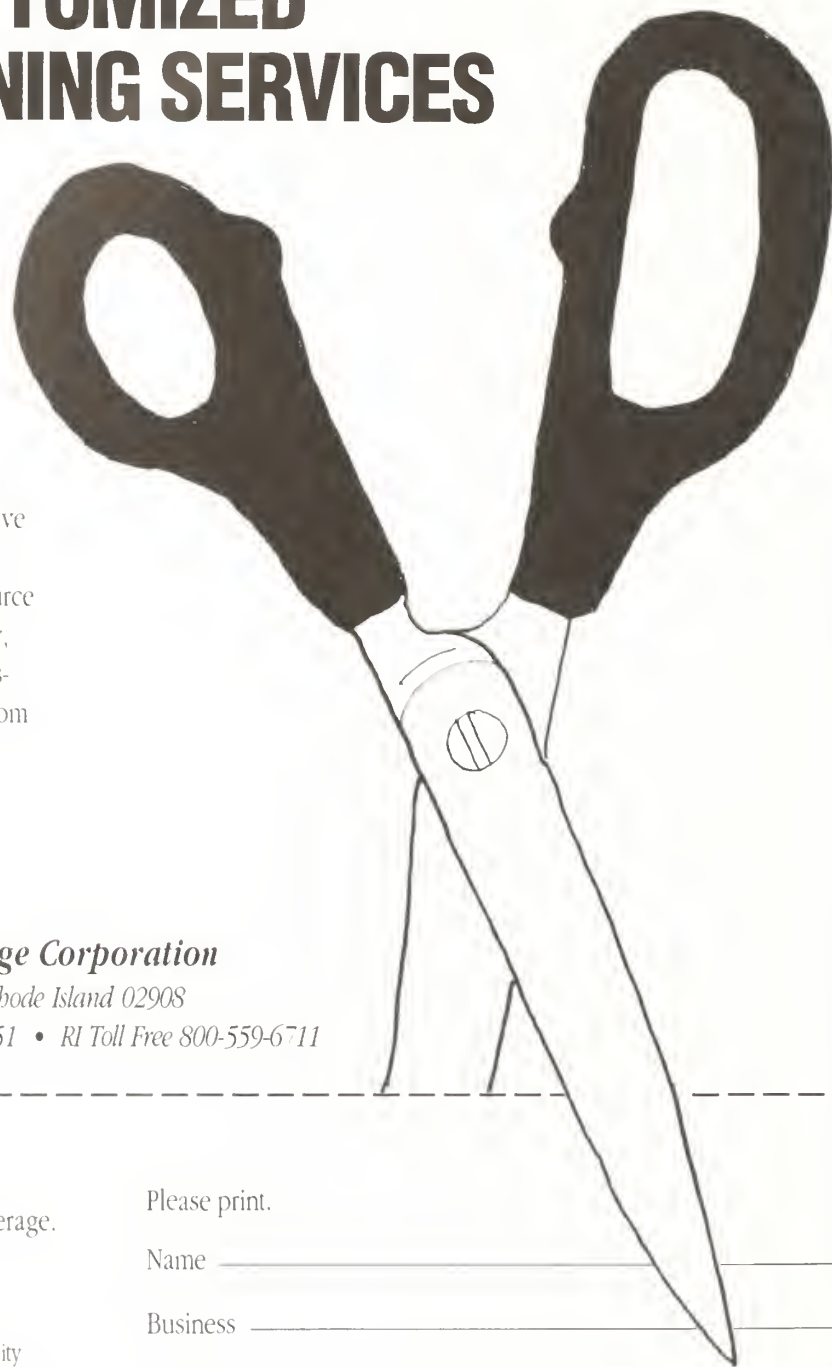
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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (August 1904)

Why Did He Die?" a paper written by G.T. Swarts, MD, summarizes the many problems, both intellectual and moral, that confront the practicing physician when he must establish a cause of death on the newly devised death certificates of the state of Rhode Island. The author upholds the notion that it is in the best interests of the medical profession to see that the standing and perfection of these death reports be maintained. In keeping with this, the author suggests that such terms as ascites, dropsy, emaciation, and debility be discarded to be replaced by more etiologically oriented terms. In childhood deaths, diagnoses such as lack of vitality or marasmus are equally unacceptable. Heart stoppage is also an inadequate term. "When a person has reached the age of 75 to 80 years it is assumed that the vital forces are so exhausted and the functions so sluggish in their action that the machinery of the system comes to a standstill without any special pathological change beyond that. And yet a great many people of advanced age do die of some special disease as from influenza, pneumonia or fracture of the hip." The author also reflects upon the conflicts between protecting the privacy of the family and the need to provide accurate diagnostic information for the good of the entire public. He cites the problem facing the family physician when a patient dies of syphilis or pulmonary tuberculosis. Physicians will often write lung inflammation rather than submit the family to possible shame. Some diagnoses, too, effectively cancel life insurance policies. Insanity as a contributory cause of death is also avoided at times to diminish the stigma borne by the family. The author concludes by reaffirming his belief that an honest interpretation of the law will ultimately be of benefit to all.

The minutes of the General Session of

the Rhode Island Medical Society are printed. The trustees of the Caleb Fiske Fund report that a prize of \$250 will be offered for the best essay on the subject, *The Sequelae of Gonorrhea in Both Sexes*. A picture of Dr Isaac Senter, found in a Wickford home, was presented to the society. Senter, a native of colonial New Hampshire, came to Newport in early life and later studied medicine with Dr Thomas Moffatt from 1750 to 1753. Senter was appointed a surgeon to the ill-fated Benedict Arnold expedition to Quebec and was taken prisoner. When released, he settled in Pawtuxet and established a medical practice of high reputation.

The proceedings of the 29th annual meeting of the American Academy of Medicine, convening in Atlantic City, are summarized. Symposia are conducted on the relationship between physicians and dentists, and the ethically managed pharmacy. Yet another symposium is entitled, *Are Modern School Methods in Keeping with Physiologic Knowledge?* The writer arraigned the schools of today "... as breeding a lot of mentally overtrained, nervous girls whose bodies, including their reproductive organs, are imperfectly developed. Such girls make poor wives and mothers and are not the women we need."

Charles V. Chapin, MD, Superintendent of Health, summarizes the health of Providence, comparing it with the gathered vital statistics of the preceding 5 years. No notable trends are evident.

50 Years Ago (August 1944)

The lead article describes the Butler Hospital Centennial celebration. Walter Edwards, president of the hospital, extols the contributions of the Brown family in establishing, and then aiding in the governance of, this unique institution, the oldest functioning hospital in Rhode Island. John Nicholas Brown then offers a

brief history of the beginnings in the 1840s of this specialized hospital. In 1844 Cyrus Butler donated the sum of \$40,000 to be joined with the prior bequeathment in the will of Nicholas Brown ("for that unhappy portion of our fellow beings who are by the visitation of Providence deprived of their reason, so that they may find a safe retreat, and be provided with whatever may be conducive to their comfort and to their restoration to a sound state of mind.") The first superintendent was Dr Isaac Ray, lately of the State of Maine Asylum.

Before actual construction, Dr Luther Bell, superintendent of McLean Hospital in Massachusetts, was sent abroad to study the latest innovations in European mental hospitals. Bell's plans established two radical departures in asylum design. First, the segregation of patients into small living communities, with private rooms for each of the patients; and second, the establishment of an institution with adequate fire protection.

Edward A. Strecker, MD, president of the American Psychiatric Association, discusses the contribution of psychiatry to democratic morale. He concludes: "Immediately after birth and throughout life, there is the operation of many inequalities largely derived from the five evils of ignorance, poverty, disease, crime and legal entanglement. Psychiatry might propose this definition of democracy: An acceptance of natural inequalities but with the endeavor to lessen the penalties incurred by the individual who suffers them and a constant and unremitting effort to remove artificial inequalities."

Gregory Zilboorg, MD, presents a paper evaluating psychiatric problems in the wake of the war. He notes: "In the wake of this war, psychiatry will find itself better prepared than at any time in its history as a branch of medicine with psychological knowledge, sociological enlightenment, and clinical experience. Its task, like the task of the rest of medicine, will be that of reconstruction and rehabilitation of the military

and civilian, direct and indirect casualties of war."

Karl A. Menninger, MD, on the centenary of Butler Hospital, offers a paper entitled *The War Against Fear and Hate*. He describes the great Dorothea Dix coming to Rhode Island in the spring of 1843 at a time when this state offered no provisions, public or private, for the care of the mentally ill. Miss Dix shared her views with many responsible citizens including Nicholas Brown who bequeathed \$30,000 for the establishment of a local retreat for the mentally ill. This, joined with the generous gift by Cyrus Butler, provided the initial funds for the construction of the hospital in 1844.

A fourth paper during the centenary celebration is provided by Alan Gregg, MD, discussing the future of the voluntary hospital. He concludes: "To ensure a thoroughly satisfactory future for the voluntary hospital we should study its past and its present relationships to the rest of society and life, and we should endeavor so to change its form and function as to maintain and acquire for it a value and significance which is peculiar and appropriate. This value will come from developing teaching and research far more intensively than at present, and from adjusting the hospital to regional needs, relying upon the quality of its contribution in teaching and research rather than upon the quantity of mere medical care."

An editorial commends Brown University in establishing a new Department of Medical Sciences.

25 Years Ago (August 1969)

Alex M. Burgess, MD and John T. Tierney author an article describing the smoking habits of Rhode Island physicians from 1963 to 1968. Cigarette smoking decreased from 33% to 22.6% during this interval. The authors state that no segment of the population, barring certain religious groups, have shown a comparable improvement.

Nathan Sonkin, MD, writes a brief article describing color changes in urine caused by the excretion of metabolites in a case of infectious mononucleosis and in an instance of paprika ingestion.

Albin Grenda, MD, describes the declining role of thoracic surgery in the treatment regimes of pulmonary tuberculosis.

Data on attempted suicide by adolescents in Rhode Island are summarized in an article by Laurence Senseman, MD.

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Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

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3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases*, 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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Health Care Reform: A Historic Moment

Health care reform is not a new topic in the United States. It goes back at least as far as The Committee on the Cost of Medical Care in the 1930s. In the intervening years there have been a number of attempts to enact national health insurance, but up to now it has not been politically possible. Currently, we seem to have reached a major watershed in US health policy.

For the first time in the history of our country, every major interest group favors fundamental change in the health care system. These include organized medicine, organized business and organized labor. Virtually no major constituency advocates the status quo. All seem to agree that we need to address the cost problem and the access problem; and that we need to address them together. This, too, is a departure from the past.

In the 1960s, the public sector concentrated on improving access through the enactment of Medicare and Medicaid and funding for community health centers. In the 1970s, the public sector swung to concentrating on controlling costs through such programs as certificate-of-need, hospital rate setting, health planning, and professional standards review organizations. In the 1980s the private sector focused on cost control through business groups on health, preferred provider organizations, utilization review and cost sharing. Now there seems to be broad agreement that access and cost must be dealt with together and that public sector and private sector efforts must be in sync.

However, while we have achieved a high level of consensus on the need for health care reform, we have not achieved a high level consensus on the method of reform. In this respect, we are unique. Most industrialized countries have had a national health policy for a long time. That is not to say that other developed countries are perfectly satisfied with their health care system; but it is

to say that most of our counterparts have established an agreed-upon approach for balancing access, cost and quality. We have not. We are still sharply divided over the ways and means of health care reform.

Essentially, we are faced with two choices since I do not see either "laissez faire" or public "national health service" (à la Great Britain) as feasible options. Our first choice is external discipline through "government regulation" as they have in Canada, and our second choice is internal discipline through "managed competition" as advocated by Alain Enthoven and others. In many ways this is an old debate between sticks and carrots, between top/down control and financial incentives, and between public monopolies and consumer vouchers.

In either case, universal coverage is the *sine qua non*. Health care reform will never be settled in the United States until we achieve universal coverage. Having large segments of the population uninsured is not an acceptable policy for a developed, civilized country.

Of course, universal coverage by itself will not produce a healthy population. Either now or later we must address the issues of public health, primary prevention and poverty.

At present, the specifics of health care reform are still being hotly debated. This is a good time to sample opinion about the direction of change. I am grateful to those who agreed to contribute to this provocative issue.

This much we know: there is no perfect solution. Whatever course we choose, we will have to take the negative aspects with the positive aspects. There is no heaven on earth!

William J. Waters, Jr., PhD
Guest Editor

The Clinical Clerk and the Two Saint Thomases

A blackboard cannot provide the experience of medicine; nor can a textbook or a laboratory. The true en-



counter with medicine begins singularly at the bedside, and for a medical student, this initial intimacy with reality is called the clinical clerkship.

To be called a clerk, today, somehow confirms the student's shaky perception of himself. Clerks, after all, are the lowest of employees in department stores, banks and dingy accounting offices. Yet, to enter the ranks of the clinical clerkship is still a unique privilege and recalls to mind that a clerk, historically, was an exalted and scholarly person.

A clerk (Latin, *clericus*), in the middle ages, was a member of some religious order; and since scholarly aptitudes were essentially confined to the clergy (also derived from *clericus*, see cleric) they were regularly called upon to write documents for legal, notarial, archival or other secular purposes. Before the Reformation, such clerks were assigned to the lesser church orders, distinguishable from the three major holy orders (ie, deacon, priest, bishop). By the 16th century a visible separation emerged between clerks and clerics. A parish clerk, for example, was now a lay officer of the church and no longer bound by pledges of poverty and chastity. Increasingly, he performed teaching, notarial and accounting chores and rarely was he called upon to aid in the rites of the church.

In southern England the word "clerk" came to be pronounced "clark." A parallel sounding shift was seen in words such as "herke" (now pronounced "hark") and "derke" (now pronounced "dark"). Cowper, the 18th century British poet, writes:

There goes the parson, O illustrious spark,
And there, scarce less illustrious, goes
the clerk.

This couplet serves two educational purposes for us: it equates clerks with the clergy as illustrious elements of society; and it rhymes clerk with spark.

By the 18th century a clerk was no longer a cleric and became increasingly a totally secular, bookish person defined as an offic-

er in charge of records, correspondence, and accounts; a person superintending the general conduct of a private or public business (eg, court clerk, town clerk.) Inevitably, though, clerking drifted to a more subordinate social station and included such menial tasks as repetitive entries and the keeping of accounts performed by such as Bob Cratchett. Only in narrowly declared settings as the town clerk or the clinical clerk does the clerkship retain some remnant of its former stature.

The clinical clerkship, as a formal component of medical education, was shaped first by the medical leadership of St Thomas' Hospital and Medical School, London, in the early decades of the 19th century. They defined the clerk as a medical student, "... who accompanies a hospital physician in the wards and keeps records of the cases."

St Thomas' Hospital, one of the great medical teaching centers of England, began in the early 12th century, perhaps 1106, as a small Augustinian infirmary of the Priory of St Mary of Overy in Southwark, a short distance south of London Bridge. Its purpose was simple: to provide temporary shelter for journeying pilgrims, both sick and healthy. In the year 1170 Thomas Becket, Archbishop of Canterbury, was murdered. Three years later he was canonized as St Thomas the Martyr and shortly thereafter the priory renamed its modest infirmary after him.

By the late 13th century, the church and its companion infirmary/hospice, while still jointly administered, were following divergent paths. The infirmary staff was small, consisting of a religious master, three ordained brothers and three professed sisters. It continued to provide for the weary pilgrim, but now also for the destitute sick and the infirm elderly. In the 14th century, St Thomas' was one of the few London facilities caring for those stricken with bubonic plague. In the 15th century, its wards were substantially enlarged by generous gifts from Dick Whittington, Lord Mayor of London.

Through 4 centuries St Thomas' endured intermittent pestilences, plagues and fires only to be closed, albeit briefly, the victim of monarchical rapacity. In need of funds, Henry VIII brought charges of immorality against the senior staff of the hospital; and in 1540, the buildings and properties of St Thomas', along with other church properties and tangible possessions throughout the realm, were absorbed by the crown.

For 10 years the hospital remained closed and its services to the London boroughs south of the Thames were sorely missed. In 1551, after the death of King Henry, the Corporation of the City of London reopened

the facility for "... the impotent and lame soldiers and suchlike poor persons." Three pence a day was the allotment for each inpatient and the staff was augmented somewhat to include a superintendent, two clergy, a porter, two sisters and a surgeon. Since the name, St Thomas the Martyr was anathema to the former king, the reopened hospital was now prudently dedicated to another Thomas—St Thomas the Apostle—although to the citizens of south London, the clerical distinctions between the two Thomases remained incomprehensible. At this time, St Thomas' was one of three institutions administered partially by the city of London. The other two were Christ's Hospital (for foundlings, orphans and sick children) and Bridewell (a house of corrections). Yet another local hospital, Bethlem, was loosely affiliated with St Thomas' but was reserved for the deranged patients.

St Thomas' underwent considerable expansion in the 18th century. Many new wards were added. For nonvenereal ailments, the wards bore the names of Kings, Queens, Jonas, Magdalen and Noah; and the sweat wards for venereal disease, Job, Lazarus, Judith and Susanna. The rebuilt facility offered 272 beds in 13 wards. One of the hospital's governors, Thomas Guy, was now instrumental in founding a new hospital specifically designed for the care of those with long-term, incurable diseases. This new, complementary facility—eventually called Guy's Hospital—was built next to St Thomas' and the two were called the United Hospitals.

The St Thomas' Hospital Medical School dates back to 1552 when staff surgeons were allowed to admit apprentices (for a 7-year training interval) according to the rules then established by the Barber Surgeons Company. Medical apprentices were referred to as cubs, later called dressers. John Keats, before he ventured into the domain of poetry, successfully completed his dresser clerkship at St Thomas' in July 1816.

In the 19th century, the united hospitals (St Thomas' and Guy's) were widely viewed as excellent centers for learning the practical aspects of clinical medicine. The medical school, with classes in excess of 100 students, provided rigorous, supervised ward training. It was only natural, then, that this tutorial experience be eventually formalized into a structured educational experience that the St Thomas faculty chose to call "the clerkship."

A forceful, resourceful and creative woman, Florence Nightingale, established the first formal school of nursing at St Thomas' in 1860, thus converting the empiric business of nursing to a formal profession with its own evolving curriculum, ethical code

and licensure mechanism.

A new and expanded St Thomas' Hospital and Medical School was begun in 1868, its site moved somewhat to the west, to the district of Lambeth on the south bank of the Thames. The cornerstone was jointly blessed by Queen Victoria, the Archbishop of Canterbury and Prime Minister Disraeli.

The coat of arms of St Thomas' reflects the many personages who have collectively sustained this institution during its 873 years of existence. One finds a nightingale, a chough (representing Thomas Becket), a Tudor rose, and still other emblems, plain or enigmatic, symbolic of those vital to the life of this unique institution. One even finds a roach (a somewhat peasant pun upon the name of Pierre des Roches, 13th century bishop of Winchester who provided early funding for the infirmary). With all of its benefactions and innovations, the most notable contribution of this hospital remains, nevertheless, its advances in the field of medical and nursing education. The devising of the supervised clinical clerkship as a bridge between the classroom experience and the independent practice of medicine stands for 150 years, unchanged, as the essential, irreplaceable component in the training of the competent physician. Stanley M. Aronson, MD

The Murmur of Hemlock

Earlier this year the US Public Health Service had reported the case of two brothers foraging for wild ginseng in the swampy forests of coastal Maine. The younger brother, age 23 years, took three bites of a plant that he had just retrieved. The older brother, age 39 years, took but one bite. Within 30 minutes, the younger brother began to vomit and convulse. Emergency medical technicians were summoned; they described him as unresponsive, cyanotic, salivating profusely, with pupils dilated and undergoing tonic-clonic seizures. He was intubated, gavaged and rushed to a local facility where he died about three hours after ingesting the root. The older brother also had seizures and delirium about 2 hours after eating the root, but eventually he survived.

The ingested root was later identified as water hemlock (*Cicuta maculata*). The Centers for Disease Control state that, on average, there are about 6 reported deaths annually in the US caused by inadvertent ingestion of parts of this violently poisonous plant variously known as wild carrot, poison parsnip, children's bane, false parsley, or hemlock. Water hemlock—and its closely related species, poison hemlock (*Conium maculatum*) and dog parsley (*Aethusa cynapium*)—are regarded as the most poison-

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ous plants in North America. The *Cicuta* species perennials that propagate by lateral root extension, favoring swampy habitats. The fully grown plants, up to 5 feet tall, have umbrella-like blossoms, similar in appearance to the common weed, Queen Anne's Lace. The root-stocks and lower stem are visibly thickened and chambered. When cut (or bitten), they exude an alkaline, pungent, resinous fluid smelling much like parsnip.

Cicutoxin, containing piperidine derivatives, is a central nervous system stimulant similar in action to picrotoxin; simultaneously it causes a peripheral nerve paralysis similar in action to curare.

Since *Cicuta* species are widespread in temperate, swampy regions, most peoples have learned of its spectacularly toxic effects through bitter experience. The Athenians went one step beyond cautious recognition and employed a decoction of cicuta as one of their means of capital punishment. In the unsettled year 399 BC, a 70-year-old teacher named Socrates was brought to trial by the ruling Committee of Thirty on an indictment stating, "Socrates is a public offender in that he does not recognize the gods that the state recognizes; he has also offended by corrupting the youth." Four hundred fellow citizens formed the jury and after much debate, Socrates was judged guilty (by a majority of 60), the selected punishment being death by hemlock. An ardent disciple said to him: "You die undeservedly." To which Socrates replied: "Would you, then, have me deserve death?" It is said that he rejected any compromise showing an indifference to his imminent fate; that he swallowed the lethal potion readily; discussed compelling issues of the day with his faithful adherents; then closed his eyes and peacefully departed this world.

This expurgated account of the death of Socrates, as recorded by Plato and others, lacks the turbulent events that customarily accompany hemlock poisoning. From a safe distance of 23 centuries, Socrates emerges now as a gracious icon of reason amidst an assembly of small-minded bigots. Were he alive today, however, his seamless skepticism, his endless dialectics, his maddening disputations, his acerbic behavior, might be less than universally appealing; and his death scene would more likely be a brief but graceless episode of confusion, delirium and convulsion. Distance has a way of sanitizing things.

No text on poisoning, classic or contemporary, fails to discuss the toxic element in water hemlock. Theophrastus even specifies when to harvest the rootstock to yield the greatest concentration of poison. Dioscorides explains why such a very small

draught of hemlock seemed to have killed Socrates (the Athenians used a concentrated solution by inspissating it under prolonged exposure to sunlight).

Hemlock, as a possible therapy, was much on the minds of physicians. By the mid-18th century, the great John Fothergill (close friend of Ben Franklin, first to describe of diphtheria and London's most eminent physician) advocated the use of hemlock as therapy for tic douloureux. Some fellow practitioners were also advocating that an extract of hemlock be employed as a benign sedative. This notion must have been fairly widespread since John Keats, who received his license to practice medicine in 1816, wrote, in his Ode to a Nightingale,

My heart aches and a drowsy numbness
pains
My sense as though of hemlock drunk,

Or emptied some dull opiate to the drains
One minute past, and Lethe-wards had
sunk.

In 1869, John Harley MD, FRCP, wrote a lengthy text entitled *Old Vegetable Neurotics: Hemlock, Opium, Belladonna and Henbane*. (A vegetable neurotic, in 1869, defined any botanically derived substance that exerted some tangible effect upon the central nervous system.) In this absorbing monograph, Harley describes his studies on the pharmacology of hemlock, using himself as the first experimental subject. When administering 3 drachms of hemlock extract orally, he noted some clumsiness, sluggish gait, dimness of vision, muscular lethargy, drooped eyelids, and diplopia. With increasing dosage, his pupils dilated, he developed third cranial nerve palsies and, according to physician-witnesses, he entered a state of "quietude and tractability"

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and was incapable of speaking or swallowing. His heart and respiratory rates remained normal, and there were no sensory changes recorded. After years of experimenting with hemlock on some of his patients, Harley concluded that it was a valuable therapeutic agent particularly in the treatment of childhood epilepsy, tetanus, paralysis agitans, choreic diseases and *laryngismus stridulus*. In one chapter, Harley specifies that the best cicuta can be obtained from an apothecary, living in Brooklyn, named E.R. Squibb. By the 20th century, any interest in the medicinal uses of cicutoxin seems to have vanished and not a single one of the major therapeutic texts now even mentions hemlock (or cicutoxin) except as something to be diligently avoided.

One of the stately coniferous trees of North America is called the hemlock (*Tsuga canadensis*), the tree that Longfellow memorialized in the oft-memorized words: "This is the forest primeval. The murmuring pines and the hemlocks . . ." It is a blameless tree of awesome dignity bearing no relationship—botanical or etymological—to the poisonous plant. The origins of the word hemlock (*hemlic* in Old English) are lost in the dim beginnings of the Germanic tongues, but it has denoted, from its beginning, only the toxic plant. In the 18th

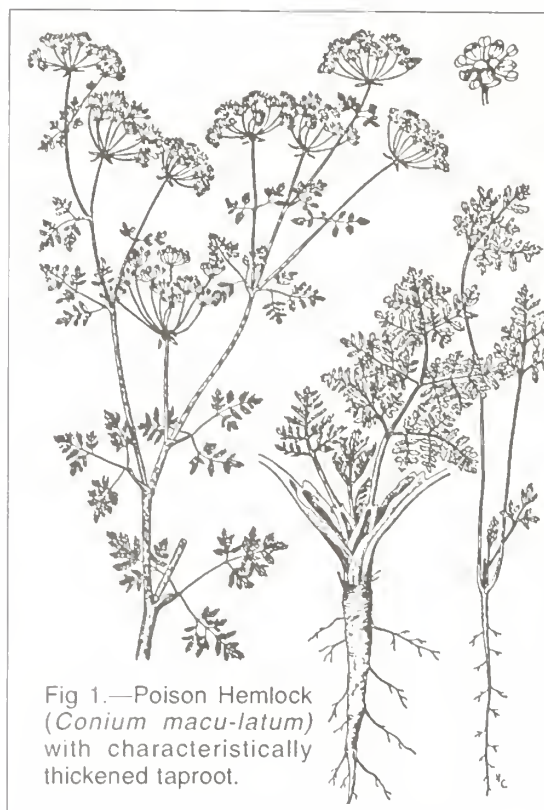


Fig 1.—Poison Hemlock (*Conium maculatum*) with characteristically thickened taproot.

century hemlock, as an adjective, was applied to certain conifers (eg, hemlock fir, hemlock spruce, hemlock yew) because the terminal leaves of the water hemlock and

the distal branches of the firs, spruces and yews resembled each other in terms of spatial configuration. It was a lamentable choice of adjective since the ambiguity persists and generations of children ascribe the execution of Socrates to some ill-defined part of a noble tree.

Yet, a closer inspection of recent toxicology texts reveals that the firs, spruces and yews are not totally innocent of poisonous element. Yews (*Taxus baccata*), particularly their bark, yield an alkaloid (called taxine, C_7H_9NO), which causes gastric irritation and cardiorespiratory depression. It is lethal to cows and deer when they nibble upon this bark. The bark of the Pacific yew tree (*T. brevifolia*), on the other hand, has provided medicine with a novel antineoplastic substance, called taxol ($C_{45}H_{66}O_4$), which shows great therapeutic promise and has recently been synthesized (taxusin).

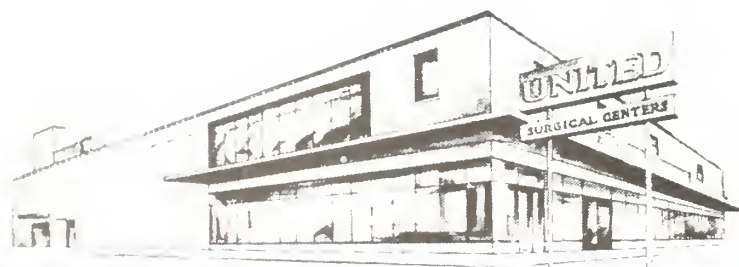
Hemlock, a name shared by unrelated botanical species, has been with us for well over 2 millennia: dependably as a lethal poison; dubiously as a neuroleptic medication; beautifully as a stately tree; and now, hopefully, as a new agent against cancer.

Stanley M. Aronson, MD

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The Emperor's New Scrubs:

Thoughts About Health Care Reform

Edward N. Beiser, PhD

My 7th grade mathematics teacher introduced me to the concept of insurance with the following example: Suppose, she said, the math book cost \$10. If a student loses his book, he has to pay the full \$10, a lot of money for us in those days. So, the teacher went on, each student in the class might contribute 25 cents at the beginning of the semester. If a book were lost inadvertently, it would be paid for out of the funds collected. Insurance, on that view, is the essentially private judgment to spread risk across a large population. Rather than possibly losing the \$10 price of the book, one contributes 25 cents and sleeps soundly at night.

We Americans are currently arguing about major changes (called reforms by their supporters) in the way health care is provided to our population. The debate frequently invokes the language of insurance. This choice of language may serve to obscure what is really going on. The current debates are not about private judgments about how to avoid risks. Rather, they are about questions of public and social policy.

Framing the Issue

Americans typically do not remember that the fire department was once a privately provided service. If one participated in an engine "company," one marked one's house with a certain plaque. If the house caught fire, the fire company responded. If the householder did not belong to the fire company, the house was permitted to burn to the ground, perhaps with the firefighters standing by and watching. Today we think about the fire department as a public service. We assume that every decent community will provide fire protection. I suggest that what is really at stake in the current debate about health reform is the question of what level of medical care a decent society will guarantee to its members, not the question of how members of our society will choose to use their private resources so as to avoid financial risk if there is illness.

On the earlier view of fire insurance, it appears obvious that the consumer decides

what level of risk to endure and decides what price he wants to pay. Thus, for example, if I am willing to have a very large deductible (the amount of initial loss that will not be compensated) I will get a certain rate. If I wish to have my entire loss compensated I may pay a higher rate. If I wish to insure a building that is very far away from a fire hydrant, I will pay more than if I wish to insure a building that is close to a fire hydrant. If I am prepared to build my home with flame retardant doors, I may obtain a lower rate from the insurance company than if I insist on building with other materials. And if I wish to protect my El Greco painting from fire, I will certainly pay a hefty premium than will my neighbor who does not have an El Greco, and I will pay more than another neighbor who owns an El Greco but takes the risk of not insuring it.

Though it may be less obvious, it is equally true that when we treat the fire department as a public service to be provided by government, fundamental social choices are at stake. I once telephoned the fire department and obtained their assistance in retrieving a kitten who had climbed a tree. The fire department had a ladder that would reach the kitten; I didn't. They came and helped me. I believe it is no longer the case in Providence that the fire department will respond to rescue calls for cats in trees. I believe it is still the case in Providence that the fire department will come and pump out a flooded basement after pipes have ruptured in the cold weather. Why should they? If I insure my home to include the risk of a flooded basement, I can call a plumber and have him pump out my basement. Why should pumping out flooded basements be part of the protection we obtain as citizens from the fire department? The response time to an emergency call for fire assistance depends in part on the number of trucks, the number of personnel, and the location of fire stations throughout the community. The definition of a satisfactory response rate for the fire department is in part a question of how public resources are to be allocated. Every nickel that is spent on building an additional fire station to permit very prompt response, is a nickel that the society has to raise through its tax structure, and which it

... it is no longer possible to believe that the well-being of the individual patient should be the only concern either of the health care professionals or of the broader society.

cannot spend on schools, on playgrounds, or for that matter, on health care.

Much of the debate about health care reform has centered on the uninsured (though it is frequently not recognized that the uninsured are not always unserved). It is vital to remember that much of the energy that fuels the contemporary concern for health care reform has to do with cost containment. We have been told for years that our industries cannot compete with the Japanese because the price of health care for the workers who produce an American made automobile is greater than the price of the steel that is included in that car. If that is indeed a legitimate social consideration it is so only because one is talking about the allocation of social resources and the establishment of social policies, not about private choices and private resources.

It has been obvious for a long time that many vital health policy decisions are made by third-party payers, not by the patient him or herself. The union that negotiates the contract with management determines the level of health care to be provided for the membership. The HMO that guarantees various forms of coverage determines the level of care to be provided. Under many of the health care reform plans currently being considered, government in one form or another (as through insurance alliances) would be making these kinds of judgments. To put

ABBREVIATIONS USED

AIDS: *Acquired immune deficiency syndrome*
AHP: *Accountable Health Partnership*
AMA: *American Medical Association*
ECP: *Essential community providers*
FFS: *Fee-for-service*
GHAA: *Group Health Association of America*
GNP: *Gross national product*
HMO: *Health maintenance organization*
MRI: *Magnetic resonance imaging*
PAHCF: *Providence Ambulatory Health Care Foundation*
PPO: *Preferred provider organization*
RIGHA: *Rhode Island Groups Health Association*
RIMS: *Rhode Island Medical Society*

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the issue starkly, it is increasingly obvious that the patient is not the purchaser of health care. Health care costs are a big ticket item in our society. As we are often reminded, he who pays the piper calls the tune.

What to Pay For?

If a decent society must provide a minimum level of medical services to its members, there needs to be agreement about what services are indeed provided. It is easy to speak about a "basket" of medical services that reasonable people expect to receive. In practice, the issue is exceedingly complex and reflects conflicting value judgments and the varied needs of different interest groups.

What to Cover: What Are the Boundaries of Medicine?

One of my favorite teaching cases was decided by the Arkansas Supreme Court. A department store ran a promotion on golden earrings. If one purchased earrings from that department store, their technician would pierce the customer's ears at no additional charge. A complaint was filed that the technician was practicing surgery without a license. (The reader will be happy to learn that common sense prevailed and the Arkansas Supreme Court did not sustain the conviction.) But why is this not the practice of medicine? Reconstructive breast surgery following a radical mastectomy is "cosmetic." Is such surgery to be included within the guaranteed health care basket? A trauma center is clearly part of the "medical" budget. Would the provision of air bags in automobiles and helmets to bicycle riders be part of the "medical" budget? There is no fixed line between health care and such other social goods as nutrition and housing. The debate about whether to "insure" against various forms of mental health needs is in fact a debate about the boundaries of the medical model.

One of England's oldest hospitals, the Radcliffe Infirmary, has developed a "day hospital." We Yanks do not normally speak about adult day care as a medical service. Should we?

What to Pay for: The Medically Indicated

The phrase "medically indicated" often masks complex social and economic policy judgments. *The New York Times* (December 27, 1993) reported heated controversy concerning the proposal in President Clinton's health plan that routine mammograms for women under 50 not be paid for, considering a National Cancer Institute announcement that it would no longer recommend that women in their 40s have regular mam-

mograms. *The Times* quoted the chief of the applied research branch at the National Cancer Institute as follows: A mammogram costs an average of \$100, and 5 million women in their 40s had them in 1990 for a total cost of a half billion dollars.

A conservative estimate would be that 94% of the tests were normal. But 6 out of every 100 patients (315,000) were called back for an additional mammogram or sonogram as the result of suspicious results, adding another \$31 million to the bill. At least 46,000 had to have biopsies, at a cost of \$2,000 to \$3,000 each, adding between \$92 million and \$136 million to the bill. Those biopsies detected about 13,500 cancers or 0.27% of women in their 40s who were screened with mammograms. *The Times* quoted one member of the Clinton health care team as saying: "If we yield every time there is a constituency that can make an emotional argument for coverage of something that is not supported by actual evidence, then we will have a chaotic, expensive and inefficient health care system in this country." Notice that the reference is not to the preferences of a particular patient but rather to the public good in general, to the overall health care system. But notice more fundamentally that the phrase "not supported by actual evidence" is not a value-free phrase. If any cancer that would otherwise not be detected could be detected by such a mammogram, quite regardless of the odds, some patients might want that protection. May they obtain it? A private RI mammography center, in its printed literature, recommends an initial mammogram at age 35 and says: "A screening mammogram can give you peace of mind since it allows for early detection of breast disease. Early detection gives you the best opportunity for a complete recovery."

What to Pay for: The Level of Care

A child presents at the emergency room with a badly cut lip. He is attended to and then the parents are told: His lip can be stitched by the resident or we can bring in a plastic surgeon. A standard eye examination can be conducted by an ophthalmologist (MD) or by an optometrist (OD). A lumbar puncture can be performed by a Brown University medical student, by a first year resident, by a 6th year resident, or by the chief of neurosurgery at a major teaching hospital. *The New England Journal of Medicine* reported a study in which nurses were trained to perform sigmoidoscopies (January 1994). The study concluded that specially trained nurses were as good at detecting colon cancer as are experienced physicians. Naturally, having nurs-

es perform this function is much less expensive than having it done by gastroenterologists.

These examples all illustrate the same fundamental question: When we speak of access to health care, do we mean substantially equal health care or minimally adequate health care?

The Politics of Reform

Alexis de Touqueville warned us that we must not confuse the familiar with the necessary. The recognition that the debate about health care reform in America is overwhelmingly a debate about social policy rather than about private preferences and judgments, at least permits us to self-consciously recognize the choices that are presented, and the values that are involved. Concededly, American political institutions are not designed to expeditiously confront hard choices. It is instructive to recall the mechanism Congress has devised to determine which military bases are to be closed. While recognizing that military bases may need to be shut down for economic and other reasons, Members of Congress have found it difficult to bite the bullet in the name of the public interest. They have created a commission that chooses the bases to be closed. The recommendation of that commission is then presented to the Congress on a non-amendable, "take-it-or-leave-it" basis. It is such a political hot potato that the Congress cannot bring itself to address the issues in any detail. The notion of closing military bases when justified by the "public interest" is comparable to providing those services that are "medically indicated." Both depend on "whose ox is being gored."

As the old joke has it, a camel is a horse designed by a Senate committee. The joke correctly recognizes that American political institutions do not respond quickly and efficiently to executive leadership. The form that health care policy ultimately takes will depend on the nature of the coalitions that are formed on its behalf. Consider in this regard Medicare, one of the most important recent social policy developments. By what logic would one base health insurance on age rather than need? The answer is not one of logic, it is one of applied practical politics. The "Grey Panthers" were a force to be reckoned with, as was Congressman Claude Pepper, one of the oldest members of Congress, and chairman of the relevant committee. The press recently reported that we now celebrate "National Adult Day Care Week." How did the powers that be decide that adult day care deserves to be celebrated by a week? See the Grey Panthers. That is precisely how our political institutions will address the question of whether adult day

care should be funded through the health care budget, rather than through a social service budget (or not funded at all).

It will not be possible to institute managed health care in any form without significant modification of the malpractice litigation system. Tort reform is a complex and controversial matter. Suffice it to say that an insurance scheme cannot set the standard of care at a given level if a trial jury can subsequently hold physicians, hospitals, or other health care providers liable for not exceeding that standard. For example, on the basis of the data discussed above, it might be decided not to provide routine mammography for women under 50. Such a decision could not be maintained if a trial jury were able to award substantial money damages to a patient whose cancer went undetected because her physician did not order a screening mammogram when she was 45 years old. Medical malpractice litigation is a subset of the law of negligence. A physician owes to his or her patient the standard of care of a "reasonable and prudent" physician, in similar circumstances. The fundamental logic of managed care is to define the "reasonable" standard of care that must be provided. What is reasonable from a societal point of view may not be identical with what is beneficial to a particular patient or group of patients. Thus we come again to a fundamental tension between the older view that health insurance permitted the discrete individual to decide what risks he or she would protect against, and the alternative view that health care is a social good to be provided by a decent society. The plaintiff in a medical malpractice action is essentially saying, "I deserved better care." At least sometimes, a reformed health care system will be saying to that patient: "We can't afford to give you what would have been of some benefit to you."

Ethical Considerations in Health Policy Reform

The Physician's Oath taken by each graduating class at the Brown University School of Medicine includes the following statement: "The health and dignity of my patients will ever be my first concern." On this view, the physician is to be primarily the patient's advocate. A physician who ordered laboratory tests without a good faith belief that they were intended to benefit the patient, would be acting unethically. A physician who ordered tests in the laboratory in which he had a financial stake would be viewed as having a conflict of interest. What then to make of the following claim by a health care economist: "It is sad to say, but there are some things that as a society we cannot do" (*New York Times*, December

27, 1993). Is there an unethical conflict of interest when the public welfare is said to require decisions to the detriment of a particular patient or to require decisions that are not consistent with the private values of a particular patient?

The notion of physician as patient's advocate is closely associated with that dominant norm of modern biomedical ethics, patient autonomy. So, too, the notion of informed consent. As the Broadway play asked, "Whose Life is it Anyway?" The implication of that title is that the patient should be free to obtain or to refuse health care as seems best to him or her. The ethical norms underlying this point of view are profoundly individualistic. I have my rights. I am entitled to determine what will happen to me. Indeed, these are the norms of free market capitalism. Those who support those values strongly call them "freedom."

When resources are limited, freedom to choose and equality of access are inevitably in conflict. It is offensive to our moral values (even if we must acknowledge that such practices sometimes occur) for the police department or the fire department to respond differently to the needs of the rich and of the poor. It is unimaginable that the fire fighters would refuse to enter a burning building in a slum to save little children because of their ethnicity or economic status, if those fire fighters were prepared to take an identical risk to save the child of a wealthy business person. And yet, our society is marked by significant economic differences. Some live in private homes where each child has a private bedroom. Some

have condos in Florida along with residences in Providence. Some sleep in the living room on a mattress and others are homeless. How different is the practice of medicine from the provision of any other social good or service? To be sure, the wealthy may purchase protection beyond the police or fire service provided by the society. They may have alarm systems and private security forces. They may have sprinkler systems and expensive smoke detectors installed in their homes that are not available to the general public.

It would be ethically offensive to respect a medic alert bracelet marked by a dollar sign that said, "I am a millionaire; treat me first." It would appear to be equally offensive to permit the wealthy to buy a place on a busy surgeon's list or to buy a place in an intensive care unit where a bed was not otherwise available, or to buy an organ to be transplanted into their grandchild where such organs were not available to those who couldn't pay. And yet, we cannot provide every medical service that might be of any benefit to any person. Individual freedom, the rights of the patient to choose his or her physician, the right of the patient to choose among alternative therapies and to reject therapies, autonomy itself, are indeed important social values. It is greatly to be hoped that the health and dignity of the patient will ever be the physician's first concern. But it is no longer possible to believe that the well-being of the individual patient should be the only concern either of the health care professional, or of the broader society.

Health Care Reform: Truth In Spending, Dollars and Sense

Joseph A. Chazan, MD

The health care reform debate is now entering crunch time. Where is the money to pay for the desired changes, and who will pay it? At this time, most reasonable people agree that not all Americans have health care insurance and health care costs are too high. We need more primary care physicians, tort reform, less bureaucracy, and a health care delivery system. Most would also agree that ever-increasing costs of health

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At this time the underserved, the underfunded, and the uninsured are receiving rationed health care.

care at a time when many Americans are uninsured, and health outcomes are not as good as observed in other industrialized nations, is unacceptable.

These observations need an in-depth analysis before one can completely concur with the conclusions. In my opinion, private insurance costs are substantially inflated because of state underfunding, federal cost shifting, and the cost of caring for those who are uninsured. Also, several socioeconomic events exist that negatively affect infant mortality, life expectancy, and other outcome data. The major sources of revenue for health care in 1994 are: state Medicaid, federal Medicare, "self-pay," the 35-40 mil-

lion people who have no health care coverage, and private insurers.

State Medicaid, which provides coverage primarily to single mothers and their children, has always been underfunded. It has paid only a fraction of the actual costs, not charges. The recent downturn in state and national economies has led to even further financial shortfalls. The Medicaid population has always been underserved professionally, and customarily receives only episodic, acute care in the most expensive facilities, ie, emergency rooms. Preventive services are rarely paid for nor generally available. A health care network to provide efficient, economic care to this population has not been in place. However, some states have already begun to direct this care to HMOs and managed care systems that have constructed delivery systems that are trying to improve care while being financially responsible. Perhaps in time this approach will achieve the desired results.

The federal Medicare budget has been under pressure for many years, and there has always been a balancing act between the expectations of the elderly and financial reality. As a result, the Medicare budget has been contained and constrained by increasing co-payments by patients, and cost-shifting to private insurers. Politically it is unlikely that the Medicare budget can be increased substantially. However, since the US population is growing older, the number of Medicare beneficiaries is increasing and a more realistic budgeting approach is needed to control cost. Again, restricted networks, using HMOs and managed health care, are being developed to control costs without compromising quality. The jury is out whether this will be effective, but it will require important compromises by both physician and patients.

Of the 35–40 million uninsured people, many are healthy, young employed Americans. However, they or their employers have found the cost of health insurance is too expensive, and they choose to be uninsured. This population receives little preventive care, and although they are basically healthy, when they do become ill or injured, their clinical course is sometimes severe, complicated, and expensive, frequently requiring prolonged hospitalization. These patients always receive care, often of the most sophisticated nature, from the “system,” ie, the cost is diverted to private insurers who absorb the cost. No simple solution or plan exists for funding this population, and it is likely that the amount of money projected to cover these services will be markedly underestimated because of the demand for preventive and maintenance health care that already exists among

these people. However, unless this aspect of the system is adequately funded, a comprehensive system cannot be created. To do what is necessary to identify the needs and raise the money to meet this demand will require great resolve because we will have to spend more money to care for these patients than is currently being expended.

Several major socioeconomic events in the US also have profoundly affected health care costs. Although many Americans receive excellent health care, others receive virtually none. The poverty in the inner city and in parts of rural America is comparable to that seen in underdeveloped nations, and the health care is comparable. The impoverished receive virtually no preventive care, and at best, minimal, episodic, expensive, and less than effective acute care that results in increased infant mortality and decreased life expectancy. These statistics help to explain why the infant mortality and life expectancy statistics, along with other outcome data, do not compare favorably with other industrialized nations.

However, there are few other countries with the size, diversity or disparity in economics and living conditions as observed in America, and until we change the basic nature of our society and improve the plight of these citizens, we will not improve their state of health and life expectancy.

Also, three major epidemics in Americans have enormous impact on the cost of health care, and whose expenses should not be borne entirely by the health care system but rather reflected in other budgets. These epidemics are: 1) Violence with firearms, which is rapidly becoming the number one killer among young adults; 2) The use of illicit drugs; and 3) HIV and AIDS, an epidemic of bubonic plague proportions.

Private insurers are also responsible in part for rising health care costs. As a group

they have generally been inefficient, arbitrary, and unresponsive to societal or community needs. US health care has been disorganized and uneven, and in no way could be construed to be a system. To create a system that works and is financially responsive and responsible, every individual needs some form of health insurance that provides appropriate services at reasonable costs. Patients, should receive the care they need, no more, no less. It will be difficult, if not impossible, to accomplish this immediately or even over several years. However, to move in that direction, we need to provide adequate primary care resources, and reduce the duplicity and inefficiencies that presently exist. Despite savings it is certain that we will have to spend more money for health care than we do now, although the rate of rise should fall (which is already happening *without* federal legislation).

The underserved, the underfunded, and the uninsured are receiving rationed health care *now*. To make this system more equitable and financially viable, however, it may be necessary to restrict access to health care services and to rationalize the use of various high-tech, expensive services to everyone. To accomplish this, patients, health insurers, and health care providers must become more responsible. There also needs to be tort reform to reduce the extraordinary cost of practicing defensive medicine.

I suggest we re-address and re-define true health care costs, with socioeconomic costs being addressed separately. A realistic health care benefit package should be identified with a cost that we are willing to pay. The “R” of reform should be replaced by responsible, rational re-evaluation of resources with a reasonable re-allocation so that every American has non-cancelable, portable health care insurance.

Changing the Way We Live As We Change Our Health Care

William Kreykes

The issue of health care reform has taken a preeminent position with the federal gov-

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... often overlooked is the cost of the way we live, or, more precisely, the manner in which our society tolerates unhealthy and dangerous lifestyles.

ernment, the media, the public and, most assuredly, with those of us in the health care profession. There seem to be as many reasons for health care reform as there are people and interests espousing it.

It is clearly time for the United States to review its health care system. Issues of access, efficiency, portability and coverage are all relevant and important for virtually

every citizen. But all these issues are affected by economics. Central to any reform is how much it will cost and to what degree it will allow the government to control the nation's health care bill.

Like so many issues of public policy, there is a tendency to reduce the health care debate to buzz words as various interests stake out positions and territory important to them. The control of health care costs is one case in point.

The cost of care is often associated directly with doctors' fees and hospital stays. But often overlooked is the cost of the way we live, or, more precisely, the manner in which our society tolerates unhealthy and dangerous lifestyles. At Rhode Island Hospital, we have been tracking admissions for over 3 years and the statistics underscore the linkage of the cost associated with the way we live to the cost of health insurance and to hospital stays. We neglect a critical element in gaining control of health care costs when we fail to address the unhealthy and dangerous lifestyles of our citizens.

Every time we pay a hospital bill we pay for the actions of others. All health care costs are driven by societal behavior. When we treat people who fail to wear seat belts, who refuse to wear a motorcycle helmet, or when we as a society fail to deal with the growing problems related to violence, the cost is borne by all of us. Not only is it tragic, it's expensive. Unless the government and health care professionals develop and implement a comprehensive program to educate people on the cost to society of such foolish behavior and enact laws to curb it, our nation's health care bill will be unnecessarily and significantly affected, regardless of the course health care reform takes.

As a hospital administrator, I have come to realize it's not enough for us to treat the victims of poor decisions. We have an obligation to encourage people to take better care of themselves. Not just by watching diets or exercising regularly (although these things are important), but about behavior that is much more basic.

Over the past 3 years, Rhode Island Hospital has treated 193 gunshot wound victims and, unfortunately, the numbers increase each year. The average cost of treatment was \$18,300, for a total of over \$3.5 million. Nationally about \$1 billion is spent annually for hospital treatment of gunshot wounds, and that figure grows if you figure in other factors such as lost productivity. A study released last month by the University of California, San Francisco, estimated the annual cost of firearms-related injuries in the United States will exceed \$20 billion. That includes \$1.4 billion in medical costs, \$1.6 billion in lost productivity caused by

disabilities and \$17.4 billion in lost productivity from premature deaths. These are costs that are assumed by insurers, the government, hospitals, employers and ultimately the consumer. Ironically, many of these tragic incidents could have been avoided. They weren't mysterious medical conditions or even common ones. They were the results of irresponsible behavior.

As one of New England's leading trauma centers, Rhode Island Hospital also treats many victims of auto accidents. Of course, accidents are not always avoidable because there are many uncontrollable variables at work (road conditions and other people). However, serious injuries are often avoidable. All we have to do is buckle our seat belts. Moreover, we should make sure our passengers (especially children) wear theirs.

In 1993, Rhode Island Hospital admitted 745 auto accident victims, people whose injuries were serious enough to warrant a hospital stay, not just emergency room treatment. Eighty percent were not wearing their seat belts; 58% of the drivers and 48% of the passengers were legally intoxicated. The average cost of treating these people was \$15,500: \$11.5 million in hospital charges that could have been reduced or avoided

with the click of a seat belt. Rhode Island is 1 of only 9 states without a meaningful seat belt law. As a result, we have one of the lowest usage rates in the country. We all have to pay for this negligence through higher health care costs and higher auto insurance rates and legal costs.

Health care reform is a complex and contentious issue. If there's one thing we should all be able to agree on, it should be that one of the most effective ways to lower costs is to keep people safe and healthy. People need to be educated about highway safety, seat belt usage, gun safety and other lifestyle factors that affect their well-being. In some cases, stiffer laws are needed, but ultimately people have to take more responsibility for their actions. Common sense and responsibility will go a long way toward reducing health care costs.

In spite of the complexity of the policy issues, every citizen can make personal decisions that will have a dramatic impact on health care demand. Fortunately wise decisions are not difficult to identify. But foolish choices—to behave in ways that have a high probability of increasing the need for health care services—will carry high costs for all of us.

Health Care Reform and the Misconception of Primary Care

Barry S. Fogel, MD

... the many visible hands of caring practitioners, or even the invisible hand of the market, may yield better outcomes than the heavy hand of central control and regulation.

The Health Security Act proposed by the Clinton Administration sets the goal of substantially increasing the proportion of physicians practicing primary care. It does so by reducing federal subsidies for residency training in specialties other than internal medicine, family medicine, pediatrics, and obstetrics-gynecology, by reducing Medicare reimbursement for consultations, and by favoring managed care over fee-for-service plans. These policies, especially the first two, manifest a specific belief that strong governmental measures are needed to discourage specialist practice. To my view, this belief and the proposed policies are based on misconceptions of the nature

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of medical care and its current weaknesses and wishful thinking about how teaching hospitals and specialist physicians are likely to respond to the proposed incentives.

Advocates for the proposed policies call attention to two problems with our current health care system. The first is a shortage of practitioners to provide timely initial care for common acute health problems. The second is a lack of continuity, comprehensiveness, and coherence in the care for persons with chronic diseases. Such persons may see a number of specialists but do not perceive that anyone assumes full responsibility for overall treatment strategy, coordination of care, response to emergencies, or interfacing with formal or informal supportive services. Increasing the proportion of generalist physicians is seen as a solution to both problems. In fact, it may be the route to costly services of inferior quality.

The activities of generalists comprise the following: 1) care for common and

straightforward acute illnesses; 2) diagnosis and treatment of complex or obscure acute illnesses; 3) management of chronic diseases; 4) prevention activities; and 5) "administrative" activities such as supporting disability claims or providing health histories for applicants for life insurance.

The activities of specialists include: 1) evaluating and treating diseases within the scope of their specialty; 2) advising other physicians on the care of such diseases; 3) performing diagnostic or therapeutic procedures that belong to their specialty; 4) managing the care of persons with chronic diseases, where one or more of those diseases are ordinarily treated by physicians of their specialty; and 5) assessing patients with symptoms or signs that might be due to a disease within the scope of their specialty (eg, chest pain and the cardiologist).

Personal experience in interviewing patients who are dissatisfied with their medical care and reading the literature on consumers' complaints about medical care have led me to the belief that more than 90% of valid complaints about the quality of physicians' care are linked to only three generalist functions and two specialist functions. Generalists do less well with diagnosing obscure illnesses, comprehensively managing chronic disease, and practicing prevention. Specialists do less well with comprehensively managing patients with multiple diagnoses, and with patients referred for a complaint that probably is not due to a disease within their specialty, but where they have a "rule out" function. In the former situation, there may be a pressing need to coordinate care that the specialist does not see as his or her job. In the latter situation the specialist may feel obliged to do a thorough, expensive and probably negative workup, yet not be obliged to address the problem the patient does have.

Patients' timely access to acute diagnostic and treatment services, as well as amelioration of the quality problems identified here, might be brought about by a combination of the following steps:

1. Expand the scope of practice of nurse practitioners in the area of treating common acute medical problems, and providing health risk assessment and health education. Provide nurse practitioners working outside of group practices, and especially those in rural areas, with 24-hour-a-day telephone access to physician consultation, with suitable mechanisms for payment of physicians for this consultation. Make full use of electronic data transfer for remote (and reimbursed) physician review of physiologic tests and diagnostic images.
2. Improve generalists' skills in diagnostic

interviewing, physical examination, clinical decision analysis, and the counseling and education of patients and their families. Improve their chronic disease management skills including functional assessment, evaluation of remediable causes of disability, use of ancillary services, multidisciplinary teamwork, and use of home visits. Encourage physicians to develop and communicate strategic plans for the common and predictable events that punctuate the typical course of most chronic diseases. Structure reimbursement so that physicians are paid fairly and adequately for the time it takes to manage chronic disease well. Reimbursement should include time spent in coordinating care and should not discriminate by site of service. In capitated plans, risk-adjustment should fully recognize the increased time and work required by chronically ill patients, especially those with multiple impairments. In closed panel HMOs, physicians with more chronic patients should have smaller total number of cases under their care.

3. Train specialists in the skills of chronic disease care, and periodically refresh (and recertify) their skills in providing generalist-level care for those conditions most often encountered as comorbidities in their practice. Offer higher compensation for those specialist visits that provide care for problems in more than one system, and for those consultations that truly offer long-term strategic care plans rather than short-term advice. Provide appropriate compensation for on-line advice to generalist physicians and nurse practitioners that enable the primary care provider to make a better immediate decision (and possibly avoid unnecessary consultations and procedures).
4. Train specialists thoroughly regarding the assessment and initial management of general medical and psychiatric problems that frequently present to their specialty. This initial management should include the art of tactful and effective communication of the diagnosis and recommendations. Use the practice guideline process and formal technology assessments to reduce both social and legal pressures to do full laboratory assessments on everyone, simply because a specialist opinion has been requested. Not every patient with an irritable bowel needs a colonoscopy nor every patient with a headache an MRI—but many specialists feel they are expected to "rule out" diagnoses by tests, even if they are confident in their judgments based on history and examination.

5. Structure payment systems to offer bonuses for the care of underserved populations, whether defined by geography, culture, or diagnosis.

If these changes were part of health care reform, the quality of all care would improve, and more people would have prompt access to the services they hope primary care physicians will provide (but sometimes don't provide very well). The percentage of generalists might wax and wane with cultural trends and the influence of medical leaders, but it wouldn't be crucial, because patients' needs for care could be met in several different and equally satisfactory ways.

The Clinton plan aims to force the issue by restricting specialty training, and reducing Medicare payments for consultation. These measures have several drawbacks, the most important being that they will have little near-term effect on access to care, except for a possible negative effect on the availability of consultations not accompanied by procedures. Moreover:

1. They will not assure sufficient access to care for underserved populations;
2. They limit specialty slots with no distinction between procedure-intensive subspecialties and those such as geriatrics, rehabilitation, and child psychiatry that are in shortage, and provide integrative services that can rationalize care and avert hospitalizations. Given the economic needs of teaching hospitals, it is possible that specialties that generate the most money for the hospital will receive preference—ie, those responsible for lucrative procedures.
3. They emphasize managed care with insufficient assurance that aggressive risk adjustment will make it worthwhile to adequately service people with serious diseases. If chronic disease care means a lower income, longer hours, and the frustration of arbitrary interference by "case managers," such care will remain a relatively unpopular occupation.
4. The combination of price controls with bureaucratic management may slow the implementation of new reimbursement structures (eg, fee-for-time; payment for consultation by wire) that might improve access, quality and efficiency all at once. Even if new ideas are appealing, health plans are unlikely to take risks when they'll be guaranteed a profit by recruiting as many healthy members as they can, and rationing care for the rest. Better service for underserved and sick populations could lead a plan to an early death by adverse selection.

In its analysis of health care reform around the world, the World Health Organi-

zation urged a slow pace of reform and well designed, well evaluated demonstration projects. This essay calls attention to just one of the many areas of subtlety in the

health care system, where conventional thinking can lead us astray, and is by no means the only kind of thing one might do about the problem at hand. In this area, the

many visible hands of caring practitioners, or even the invisible hand of the market, may yield better outcomes than the heavy hand of central control and regulation.

The Politics of Health Care Reform

James A. Morone, PhD

Americans have been debating national health insurance for 90 years. The content of this elusive reform has changed much faster than the tone of the debate. When Theodore Roosevelt championed the reform (during the 1912 presidential campaign) he was after a hardy stock of Anglo-Saxons—health insurance would help deliver white America from “race suicide.” More than 30 years later, President Truman made health insurance the major domestic issue of his presidential campaign; his goal was an extension of the New Deal social welfare state. Today, the reform that was once condemned as too costly is widely prescribed as cost control.

While the reform itself has changed, the debate that surrounds it remains entirely predictable. On one side, self-confident experts tout complicated, rationalizing schemes. On the other, conservative critics wheel out emotionally charged (and very effective) arguments. The shrill rhetoric has alternately bemused and baffled observers. Compulsory insurance was “a dangerous device . . . announced by the German emperor” (in 1918), a force representing “social theory . . . socialism, even communism” (in 1932), “the keystone to the arch of socialism” and “a threat to every area of freedom as we have known it” (by the 1960s). And always there were the specters of rising taxes and rampant bureaucracy.

However, too much attention to the rhetorical pyrotechnics misleads many observers. Why don't Americans have national health insurance? Answer: the dreaded American Medical Association (or, more recently, the Insurance Industry or Big Business or Small Business). A variation of this interpretation suggests that the groups and their rhetoric provoke a deep-seated Amer-

ican unease with government action. A combination of interest group muscle and a cultural dread of government defeats health reform.

Focusing on political institutions suggests an overlooked alternative. National health reform has been wrecked by the organization of our government. The checks and balances, rooted in the Constitution and exacerbated by each generation of political reform, create a policy apparatus that is maladroit at securing broad policy changes. After all, if the United States had been playing under English (or German or Canadian) rules, the Truman administration would have had the opportunity—indeed, it would have been expected—to legislate the health reform it had promoted on the hustings. American national health insurance would have arrived roughly on time compared to other industrial democracies.

Enter Clinton

The Clinton administration seemed to follow the usual political calculus. Its proposal seemed almost self-consciously designed to divide potential opponents. Big insurers would win, small ones lose; businesses that now offer generous health benefits would support the plan, the stingy would oppose; physician supporters would balance out the opponents. With divisions criss-crossing the interest groups, the administration could perhaps build its reform coalition.

The difficult institutional realities were overlooked. Compromises forged in the executive are thrown open again in the legislature. Congressional rules do not promote stable alignments of winners and losers. Seven Congressional committees and subcommittees play a significant role in the fate of the health legislation (reportedly, 31 have at least a sliver of jurisdiction). Again, past reforms (this time, the Congressional reforms of the 1970s) made power more diffuse, action channels more fragmented, change more difficult.

Even if the Clinton health reform negotiates the Congressional labyrinth it still faces a daunting political gauntlet: the implementing bureaucracy, enabling legisla-

A combination of interest group muscle and a cultural dread of government defeats health reform.

tion in 50 states, implementation on the local level, the inevitable challenges in the courts.

Opponents have plenty of institutional back alleys from which to mug the Clinton's health reform. As the critics seem to multiply, potential allies retreat, public opinion falters, media coverage turns negative.

How to rally support? The Clintons have found temporary relief by bashing insurers and emphasizing universal coverage. But the core reform idea, managed competition, is not well geared for the American political process. It is too complex to rally public support, it is too finely calibrated to survive the long rounds of deliberation, horse-trading, implementation and litigation.

Managing Competition

The Clinton plan is complicated for a good reason: it is designed to fix the current health financing mess without making any radical breaks with the past. It takes the present competition among payers and tries to coordinate (or manage) it.

Make no mistake, the competition in contemporary American medicine is precisely what got us into our health policy. Multiple competing payers each trying to contain their costs lead directly to the American legions of uninsured—60 million people spent some time without health insurance in a recent 18-month period. The financial incentives for each employer, insurer and health care provider are clear: seek the healthy, shun the sick. After all, a relatively small number of patients run up the big bills. Avoid them, and it is easy to offer good quality care at a lower price. The financial losers are those who treat (or insure or employ) very sick people. The insurance pool has been fractured as each payer chases after the good risks. The good bets are not hard to find—they are younger, wealthier, and better educated. We have developed a stunning technical capacity for ferreting out bad risks. Actuaries have refined their measures, medical information networks are extraordinarily sophisticated, the human genome project is mapping the markers for diseases that people will be prone to decades in the future.

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Moreover, as a large literature now makes plain, multiple payers each pursuing their cost control programs offer multiple safety valves through which providers shift costs and recoup income. And the effort creates an enormous administrative apparatus as providers, payers, patients and employers volley billing information back and forth.

Even beyond shrinking coverage and rising costs, health care competition is thick with complications. Most citizens believe we should offer some care for all citizens, even the improvident who have lapsed on their insurance coverage. In a democratic society, the last hospital in town will be bailed out, even if it is inefficiently managed. Few consumers are well enough informed to evaluate alternative treatments or providers. Insurance coverage removes the incentives to shop for the best medical deal.

The President's Health Security Act runs its infamous 1300-plus pages because each of these facets is at least partially addressed. Payers, health care providers, employers, and patients have all got to be meticulously aligned to avoid the perverse consequences of competition. In medicine, getting competition right is a complex proposition.

At the heart of the Clinton effort sit administrative agencies known as the regional health alliances. In effect, the alliances would manage the health care for more than 80% of those under 65.

Critics immediately lashed the alliances: Too much bureaucracy, too much regulation. The great irony is that the effort to preserve health care competition is what necessitates the regulation. Health markets can only work with effective, nimble oversight. Someone—call them alliances or regulators or health boards—has got to referee the complex health markets. Without oversight, entrepreneurs in a dynamic environment will find creative new winning strategies for grabbing healthier patients and shifting costs. Without careful management, the new health care competition will yield the same old troubles: eroding coverage, rising costs, nervous citizens, cost shifting, chaos.

Did the plan get the alliances right? No. With so many features of the new system at stake, the alliances are far too crudely worked out. The organizational details are largely thrown up for grabs later in the political process.

Apart from design flaws, the alliances are not likely to survive two related political dangers. Conservatives push to eviscerate them altogether—all but assuring that the new health competition will repeat the troubles of the old. On the other side, the Clintons' allies urge them to drop the administrative details and joust over headline issues like universal coverage and employer man-

dates. Both strategies lead to the same trouble. An overly complicated health reform proposal loses its institutional mechanisms as it moves through Congress. Again, the American political process risks producing an ambitious policy initiative stripped of implementing guidelines and administrative capacity. Managed competition makes no sense at all without a strong manager.

The Alternative

But never mind the technical difficulties, the Clinton plan's gravest troubles are political. The health experts did not serve Bill Clinton well. They concocted a system entirely innocent of politics. The plan is not designed for mobilizing public support—the public does not understand it. Nor is it suited for political horse-trading—the plan has too many interrelated parts. Unfortunately, public uproar or insider compromises are the only ways to successfully introduce big changes in our political system.

There is an alternative. A popular health

care program is available: Medicare. The institutional infrastructure is in place, popular loyalty established, whispers of socialism unlikely. A careful analysis of the organizational imperatives throughout the policy process (Congress, implementation, administration) makes the program a sensible basis for any health care reform. Indeed, Medicare was originally designed to be a first step to national health insurance.

With a realistic political framework, long tested in the world of politics, the administration could get on with reforming health care: Do we use Medicare to set a global budget and leave medicine to the medical providers? Or do we use the program as a vehicle to continue micro-managing medical decisions? Do we inject competition into the system? Or do we finally give up that ghost and learn the lessons of comparative health policy? Whatever the final choices, a genuinely successful health reform awaits a more politically savvy institutional frame.

In Pursuit of Health Care Reform: Will Market Forces Or Government Decree Prevail?

Robert D. Coli, MD

At the start of his second presidential year, Clinton's 1,342-page, 5-pound quest for universal health insurance access for all Americans is generating an increasing number of political and strategic problems for his Administration. The US Chamber of Commerce and Business Roundtable have withheld their support because of the plan's "burden of high employer premium contributions, rich benefits, and counter-productive regulation." At the same time, at the opposite end of the political spectrum, liberal lawmakers, consumer advocacy groups, and labor unions have criticized Clinton for compromising on "the fundamental principles of health care reform."

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"There is no third system between a market economy and socialism. Mankind has to choose between these two systems—unless chaos is considered an alternative"

—Ludwig von Mises

It is not surprising that ordinary citizens as well as most health care providers and payers are increasingly confused and anxious about the direction of reform, and how best to adapt to it. There really are no known facts about the future. However, after three decades inside American health care, I thought I might offer my personal views on health care reform.

Federal, state, and local governments currently use tax revenues to pay for about 42% of all health care spending. With such a massive stake in the outcome, what is the appropriate role for government in health care reform? In my opinion, federal and state governments should abandon grandiose schemes like the Clinton plan, which George Will has accurately described as "the most gargantuan permanent expansion of government since the New Deal." The first thing Congress should do now is follow the advice of Alain Enthoven, one of the principal developers of managed competition, and "delete pages 1 to 1,342." Next,

Congress and the state legislatures should seek to ensure the development of as nearly a perfect health care market as possible.

To facilitate this, legislators should ignore, rather than solicit, the "rent-seeking" of special interest groups. Rent-seeking is a term used by economists to describe the various efforts by special interests to influence political decisions that will affect their businesses. Legislators' love affairs with rent-seeking special interests is one powerful reason that the health care market is still imperfect. (A perfect market in health care or any industry requires the presence of three conditions that are rarely met in the real world. Buyers must have perfect information about the sellers' good; sellers must have free access to, and exit from the market; and no buyers or sellers should be large enough to move the market price by themselves.) The more that government infiltrates all facets of economic life, the more corruption and the more rent-seeking behavior. Not surprisingly, rent-seeking exists in Rhode Island health care. A good example is the recent legislation approved by the RI House of Representatives (on an 82-10-7 vote) that would selectively bar one of Rhode Island's largest health insurers from excluding four hospitals from its 12,000-member medical insurance plan for Medicare recipients. Another example is the legislation introduced by the RI Pharmaceutical Association and enacted by the RI General Assembly in 1993 that allows the RI Board of Pharmacy to revoke or reject the license of any pharmacy in which physicians have more than a 10% interest. As Milton Friedman has pointed out, "Whenever someone complains about competition, consumers should beware."

The second major reason that health care and other markets are imperfect is the inevitability that sellers will do everything possible to fix a price higher than a perfect market would dictate. To counter this, instead of trying to roll them back, all three branches of government should support rigorous enforcement of all existing laws and regulations related to anti-trust, fraud, and abuse. Because rent-seeking and profit-seeking are intrinsic to the human condition, the linkages between the health care business and politics should be weakened, not massively increased as is now being proposed on a national level and in many states. In my opinion, government should function as a facilitator and referee in health care, not as a director of resource utilization or selector of winners and losers.

Recent developments suggest that the creators of the Health Security Act and similar schemes are either unaware of, or are ignoring the accelerating transforma-

tion of US health care from a cottage industry driven by consumption to one driven by budgets. Real change in medicine has not been waiting for Congress to act. Individual businesses of all sizes are merging into integrated, community-wide networks. As old boundaries fall, the era of open-ended fee-for-service payment, guaranteed market share, and absolute provider autonomy are giving way to selective contracting, capitated payment, and new alliances and partnerships. To benefit from these dramatic changes, the most savvy providers and insurers have already restructured their businesses, and are developing and deploying the advanced information technology needed to increase productivity and reduce costs.

All of this pre-reform activity may be having a beneficial effect. After more than two decades of annual double-digit increases, the health care inflation rate dropped to 6.6% in 1992 and was only 5.4% in 1993. Even pharmaceutical prices are being favorably affected. Since 1987, mail order pharmacies have been discounting brand name and generic drugs by approximately 30%. Between 1987 and 1992, other drug distribution channels, such as managed retail and hospital pharmacies, have more than doubled their discount levels from about 12% to 27%. Prescription drug price inflation has also been slowing down. According to First Data Bank's Third Quarter Drug Price Report, average wholesale prescription drug prices rose at a slower rate through the first 9 months of 1993 (4.1%) than in the same periods in 1992 (4.6%) and 1991 (6.0%). Remarkably, all this has occurred even before Clinton's plan for a National Health Board with power to "encourage reasonable prescription drug pricing" was submitted to Congress.

Respondents to a recent Kaiser Family Foundation survey showed more concern for the impact proposed health care reforms would have on their personal finances and were less concerned about issues such as the federal deficit or health care inflation rates. This focus by individuals on their own economic self-interest is hardly surprising. Most Americans, including the 10 million health care workers, do expect enactment of legislation that will significantly change an industry that already accounts for one-seventh of the economy. At the same time, the public's confidence in the government's ability to solve social and economic problems has seldom been lower. It remains to be seen whether reform legislation will augment or block the powerful market forces that have been reshaping the industry while the debate has been raging.

It is important to recognize that the goals and objectives of the Health Security Act

and similar plans are not new. Indeed, for the last 50 years, the government has been intervening in health care, always intending to make it easier for more Americans to get the care they need. Invariably, the result has been an increased demand for services, less competition, a restricted supply of service-givers, and claims that provider greed, fraud and abuse are the root causes of the inevitable price increases.

I suspect that, if they really had a choice, most quality providers and payers—and their patients—would prefer more competition and less government. Market-based incentives for cost control and quality are working quite nicely in other large, complex businesses like the personal computer industry. Enactment of an American "Personal Computer Security Act" would hardly benefit the worldwide pro-consumer trends in computer prices and computing power.

The only real alternative to a freer health care market with more competition, is cost-control by government decree. There really is no effective "middle way." Unfortunately, half a century of experience elsewhere provides convincing evidence that politicized rationing and giant increases in bribery, corruption, and influence-peddling are the inevitable results of government-controlled health care. I hope that economic common sense will prevail. Perhaps, this time, reform-minded legislators will choose to enhance the power of the market by harnessing private incentives for the public good, rather than further increasing the power of government.

Next month in . . .

Rhode Island **MEDICINE**

Physician's Health In Rhode Island

Guest Editor:

Herbert Rakatansky, MD

Health Care Reform and the Future Of Community Health Centers

Stanley Hoyt Block, MD

... taking care of poor, sicker, non-English-speaking patients would and should take more time than caring for a more middle-class population.

Before the establishment of community and migrant health centers, the poorest US citizens had few choices for medical care. Many lived in areas in which few, if any, medical providers were available. Financial barriers kept most from seeking preventive care or health maintenance. Hospital emergency rooms became their "family doctor" for the lucky ones who lived near a hospital. Cultural and language barriers as well as financial difficulties prevented millions from getting the care that they desperately needed.

Through the creativity of two New England doctors, a new health care model for poor communities was born in 1965. The first two neighborhood health centers opened in Mound Bayou, Mississippi, and in a housing project in Boston. In 1966, an amendment to the Economic Opportunity Act established the Comprehensive Health Center Program. Since 1975, community health centers have been funded under Title III Section 330 of the Public Health Service Act, and migrant health centers are funded under Section 329. The requirements for both programs are virtually identical. Annually, Congress appropriate funds that are administered by the Bureau of Primary Health Care of the Public Health Service. These funds support more than 550 community and migrant health centers that serve more than 6 million poor Americans. Community health centers emphasize family-oriented, preventive and primary care to the underserved. These are the very health services that the country needs so badly. Health centers emphasize full immunization of difficult-to-reach populations, pediatric and adult preventive services, pap smears and mammograms for women, lead screening and disease prevention for children, and education of parents on health matters of critical importance to their families. Community health centers provide access to

primary care during illness and often see poor patients with multiple medical and social problems who are referred to health centers by other facilities.

As we look towards universal health insurance, which we all applaud, what is the future of the community health centers that have cared for the uninsured and disadvantaged for more than a quarter of a century? Will they vanish from the American landscape, or will they play a vital and pivotal role in assuring access to health care for all Americans?

Of course, health centers strongly support meaningful health care reform, including guaranteed coverage, comprehensive benefits and improved access to care—especially preventive and primary care. However, health centers believe that reform must also assure access to adequate health care, not just insurance to pay for it. Insurance in itself, while essential, does not always make health care accessible. More than 43 million Americans, living in the inner city and rural communities, are medically underserved because of their special needs or circumstances, although 60% of these patients have some coverage. Epidemics of measles, tuberculosis, AIDS, teen pregnancies, and sexually transmitted diseases all show a system that is failing the medically underserved, a majority of whom are members of minority groups. Despite institution of health insurance for all, these Americans will continue to face barriers to care including language and cultural barriers, lack of primary and subspecialty health providers, and fear of the care that they receive at "big institutions."

Health centers are delighted that President Clinton has made health care reform one of his top priorities, but some elements of the plan raise serious concerns about how well or poorly the reformed health system will serve the unusual and unique needs of America's poor, minorities, and underserved. The President's plan relies heavily on managed competition, but many managed care entities and HMOs have historically avoided the underserved because of their extra needs (translators, transportation, etc.), the inherently high costs and the difficulties faced by providers in caring for

this population. Health center patients often have no phones, change addresses frequently, are noncompliant with medical regimens, and speak little or no English. For such vulnerable populations, managed competition may fail to improve access to care, and could even prove detrimental to such patients.

Our major concerns about the President's plan are as follows:

Access to Care: The President's proposal to expand services to underserved areas contains no assured funding and may actually take resources away from successful health centers to give them to totally new programs. This raises the worry that existing programs, such as community health centers, family planning, maternal and child health, and Ryan White programs will be competing against new programs for scarce federal dollars; all efforts will be compromised if such a scenario occurs, and the objectives of health care reform will not be achieved.

Essential Community Providers: Although the President's plan recognizes health centers as "essential community providers" (ECPs) and protects such ECPs by contracting and minimum payment requirements, these protections will not fully safeguard the ECPs against excessive financial risk and allocation of the sickest patients to community health centers. Furthermore, health centers could be disqualified for reasons of "low productivity" even though it should be obvious that taking care of poor, sicker, non-English-speaking patients would and should take more time than caring for a more middle class population. Many new immigrants with virtually no prior medical care will probably continue to be seek care at community health centers. Certainly, some protection for the health centers concerning productivity expectations and financial risk needs to be encoded into law so that the health centers will survive and continue to serve these most difficult populations.

Health Professions Training: The President's plan leaves the medical schools and teaching hospitals essentially in charge, assuring payment to health centers that are training sites only for direct (but not indi-

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rect costs), and only if they operate such a program, but not if they participate in one.

We believe that the following additions to the plan are essential, not only for the long-term survival of the health centers, but to truly assure access of the underserved communities to optimal health care:

1. **Assure substantial investment of guaranteed resources** to support programs that now successfully provide vital services to the underserved and disadvantaged, including the community health centers. New investment in disadvantaged areas should not be at the expense of current, successful programs.
2. **Provide strengthened safeguards for ECPs** that assure preservation of the current safety net in underserved communities and that provide for their full participation in the new health care sys-

tem. The increased costs of caring for the non-English speaking, underserved, and high-risk populations must be addressed; otherwise health centers that serve large numbers of such patients will be out of business in a few years.

3. **Assure the participation of ECPs in health professions education and training** and provide adequate payment to cover the cost of this involvement in the education of the next of physicians. This will greatly alleviate the currently short supply of primary care doctors who wish to work with underserved, high-risk and minority populations. Community health centers with teaching programs have produced hundreds of family physicians, general internists, and general pediatricians—exactly the kinds of doctors our system desperately needs. We'd like to

have direct access to medical education funds so that we can provide practice opportunities for medical residents and medical students who will then be more likely to practice in underserved areas.

The community health centers have become, over the past quarter century, experts in addressing the health care needs of the most difficult to reach populations. Their skill, dedication, and enthusiasm for this mission should be incorporated and enhanced in America's new health system. We are very fortunate that Senators Chafee and Pell and Congressmen Machtley and Reed all share our vision of strong and vibrant health centers. We applaud the President for his bold new steps towards health care reform. But we need to assure the best parts of the present system are not lost to the future.

Predicting Reform: The Carving Up Of Clinton and the Resurgence of the States

K. Nicholas Tsiongas, MD, MPH

Reform of how we deliver care in America is again at the top of the nation's political agenda. The forces for reform have grown exponentially over the last 15 years, but it is far from clear they are strong enough to prevail. The debate has advanced due to the power of a president to set the agenda. But the President himself knows that agenda-setting is not change. Indeed, it is becoming apparent that much or all of Clinton's plan is in jeopardy. It is within the character of present-day legislatures that, barring consensus, little or nothing may result even from a much-touted Year of Health Care Reform. But what is also clear is that even if Congress rejects managed competition, individual states will not give up on reform. We would remain only one successful state experiment away from restarting national reform. Whether single payer or managed competition, such a state plan will be characterized by universal access and global budgets, if not today, tomorrow; if not tomorrow, soon.

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Bill Clinton has embarked on a perilous journey for his presidency. It is a journey to untie the twin cords of the health care Gordian Knot, universality of access and cost containment, and at a time both of vigorous opposition from powerful provider and insurance interests and of increased mistrust in federal and state governments.

The struggle for health care reform—its possibilities and improbabilities—is emblematic of what is wrong with democracy in 1994. Political parties are without central credo, legislatures are undisciplined, and popular will is fractured into competing groups—where the majority view, weakly held, is often defeated by the minority view, often strongly held and better financed. "Money," said the Supreme Court, "is speech," and so, both in political campaigns and in legislative lobbying, those with the most money get to speak the most. It should come as no surprise that, at least in this stage of the battle, the opponents of reform have more money and are better organized.

But in the popular mind, reform is overdue. In order for the opponents of reform to succeed, they must use their resources to convince the public that there is something to fear in significant change. As a consequence, the battle is not without peril for the opponents of reform as well. They may win, but only if they clothe their efforts as some kind of progress. The battle is for more than

reform of the health care system: it is a battle for political position and electoral victory or defeat. As such, reform opponents cannot be seen as thwarting the popular will.

With everyone a reborn "reformer," how can one tell who's winning? By threatening a veto over the issue of universal coverage, Bill Clinton offered an answer. The veto against any plan that promised less than coverage-for-all was good strategy. It signaled the unacceptability of virtually every other current plan except the single payer. Any plan that guarantees universal coverage would have to identify a way to pay for it—pro forma in Clinton's plan, anathema to most of the others. Most importantly, the public understands and supports universal coverage by a large margin. And lastly, the president signaled that he was willing to compromise on anything else (perhaps less a measure of Clinton's reasonableness than what awaits his bill in committee).

But Clinton is no Bush. He will not sit back and rest on his veto threat. His experience as the country's longest-serving governor taught him more about in-fighting, compromise, and resurrection than any president since LBJ. He will require those talents. He must contend with a number of members of Congress of his party who know more about health care reform than he does, do not support his plan, and are intent

We remain one successful state experiment away from restarting national reform.

on letting him know it. He has only a razor-thin Democratic majority in the Senate, a looming mid-term election that his party would be expected to lose, and thus only 6 months to pass the thorniest piece of legislation in decades. Senate Budget Committee Chair Moynihan and House Majority Leader Gephardt have already told the President that his proposal for health care alliances is dead. This is the fundamental market-based, cost-control element in his plan. The health care bill in the House is being marked up in two Clinton-averse subcommittees and the president's main Senate supporter, Majority Leader Mitchell, will be a lame duck this year. The Right has targeted not only Clinton's alliances, but also the employer mandate and insurance rate controls. Competing plans by Representative Jim Cooper (managed competition with no employer mandate) and Senator John Chafee (managed competition with a delayed mandate on individuals) are also garnering support on the right. Meanwhile, fully one-quarter of the House supports a single payer system. The early indicators are that the only consensus on health care reform in Congress is that Clinton's plan is not it.

The President's plan is clearly the most detailed and, therefore, most honest of the managed competition plans. It is precise in what services would be covered, how they would be paid for and how costs would be controlled. It ties universal coverage to cost containment as the sole means of solving the crisis. It would put in place a form of Enthoven's managed competition system by setting up large alliances of insured individuals that would buy health care services from a few health networks in each region. Each network would offer the same comprehensive package of basic services and compete on the basis of price and quality for greater market share of alliance premiums. If such competition were insufficient to control costs, the alliances could exercise price controls on premium increases. At least one health network in each region would be a fee-for-service plan that would not limit choice of physician. The funding for the expansion of services to the uninsured would be borne primarily by mandating that small businesses that have never before offered their employees insurance begin to do so.

Managed competition relies on a delivery system that has never been tried anywhere in the world. Although it would probably eliminate a number of small, private health care insurers from the marketplace, it leaves layers of unnecessary private bureaucracies in place and adds a new layer of public bureaucracy to manage them. The

system will rely on a small number of health care plans in each region, probably corporately owned, that would compete among themselves. The incentive to collude among such plans will be ever present. The system will rest buying power in a small number of alliances of individuals and businesses that would bargain down potential cost increases. Although theoretically better than the relative absence of concentrated buying power in our present system, it is clearly less effective than would be the monopsony power of a single payer.

The retention of competing insurance bureaucracies, the incentive for implicit price fixing on a regional basis, and the probability that much of the country does not have the population density to support enough plans to assure competition—all make the cost savings of such a plan limited. Although there probably would be initial cost savings as a greater segment of the market becomes managed, studies continue to show that annual premium rate increases are comparable between managed plans and indemnity insurance plans. Even the ability of alliances to cap high-end insurance premiums may be insufficient to discipline the cost spiral.

Although the "proletarianization" of the physician, which was predicted by some critics of HMOs 20 years ago, has not happened, the "corporatization" of doctors has continued apace, and managed competition enshrines the idea. As more doctors are enveloped into privately owned care networks that will compete for premium dollars, the tendency for corporate interference with a doctor's practice decisions and with the doctor-patient relationship is unavoidable. This should sound and feel familiar to doctors. It has been their premiere complaint for the last 15 years against the often unsuccessful private and public attempts at cost control. In this respect, managed competition promises that such interference will become completely institutionalized. Although the President's legislation mandates that one health care plan in each region must be fee-for-service where people could presumably choose their physician, this will invariably be the most costly and therefore least attractive of the plans offered.

One remarkable element of Clinton's plan has come to be referred to as the "state option." It provides that states can institute their experiments instead of the federal model. (Perhaps more remarkable and reprehensible is that Representative Cooper's bill expressly forbids any such state experimentation.) This provision reminds us that the cauldron for policy experimentation in health care delivery over the last decade has been the State House and not Washington.

Indeed, the employer mandate and key elements of managed competition started in state capitals.

Rhode Island has been late in initiating significant steps toward universal and cost-effective reform despite impressive intellectual resources in both the business and public sectors. In part, this is reflective of the strong and often diverse influences of the insurance, health care, and small business lobbies in the state. Likewise, those supporting universal health access either have focused on national reform or never had the ear of the movers and shakers at the State House. Finally, there has been a clear absence of interest in significant state-based reform in the governor's office in both the DiPrete and Sundlun administrations. The General Assembly initiated some insurance market reforms to benefit small businesses that had been tried in other states and had equally meager results. Likewise, the Assembly tinkered with expansion of health insurance for special populations (Rite Start). Recently, this gave way to Governor Sundlun's managed care system for some people on Medicaid (Rite Care), perhaps the most significant change of the decade, but objectively modest relative to the magnitude of the crisis.

The disarticulation of the Clinton plan should serve as a challenge to Rhode Islanders to begin planning solutions to the problems of universal coverage and cost containment. Rhode Island's compact size, mature health care industry, and medical education infrastructure lend themselves to a state-based solution. Accordingly, our state government should lobby our Congressional delegation to preserve the "state option" in any final health care proposal. Legislative proposals to prohibit state experiments represent pure special interest caprice and have no place in reform legislation.

There are some immediate steps that Rhode Island can take in devising a successful plan for reform.

- We should inventory our providers and services to assess our current strengths and weaknesses, learn what we do well, and what we provide too much or too little of. We should review the Oregon Plan to better prioritize health care services as an aid in service planning.
- We must insure the new Rite Care system is working well in data collection, enrollment, system organization and payment to providers. We can begin offering to integrate all state and city employees into such a managed system as an intermediate step in increasing the state's buying power of health care services.
- We should assess the costs of funding universal coverage on a statewide basis,

identify a half dozen sources of funding and begin the necessary public debate on each option.

We should consider a state drug formulary, giving priority to using effective but cost-saving medications and negotiating with drug companies over prices.

We must recognize the legitimate concern Rhode Islanders have about trusting their government. Any new mechanism to pay for and deliver care must be structured so that people will have confidence that it will be simultaneously incorruptible and accountable. On the other hand, we need to confront the cynics—often in our own local media—who see the private sector as the paradigm of efficiency, trust and accountability, and disregard that this most privatized system in the industrialized world is a mess. We should also remind them that Medicare is run more efficiently by an order of magnitude than the private insurance sector.

After all the political posturing and rhetoric, we need to admit that the only way this delivery system can live within a budget is to explicitly set a budget for it. When that happens, we can reasonably decide what it is we should be doing, and we should leave doctors alone to do it.

For patients, we need a delivery system that allows the latitude to choose their doctor, knowing full-well that they often use poor criteria in their choosing. For doctors, we need a system that interferes least with the doctor's day-to-day caregiving decisions, freeing her or him to be the advocate for the patient, not for the cost-cutter.

We must devise a means to compensate the victims of negligence, malpractice and poor outcome—even those who do not sue. And the time has come to recognize that no physician intends her or his actions to inflict additional pain or suffering—and as such we should reserve, for exceptional cases (or cap) pain and suffering awards in the courts.

Additionally, the time is coming for antitrust prohibitions to be lifted from physicians (particularly with the advent of global budgets), so that doctors can negotiate as a class and be left alone to do what they do best—practice medicine.

There will be little state-based reform, however, without leadership from the top. We should demand from our candidates for governor explicit positions regarding insuring the uninsured and containing health care costs. Candidates in both parties have spouted pleasantries for years about health care reform, but who to this day have never dedicated themselves to a solution. Those of us for whom this issue is paramount need

to identify the candidates who are dedicated to changing the system and commit ourselves to their election.

Predicting the political future of national reform is always perilous, but some political verities are instructive. Politicians, being human, tend to avoid risk, and there is less risk today in passing "something" of health care reform than nothing. Clearly the final plan must have a semblance of universality of access for the President to sign it (even if that access is phased in over years). But this issue is volatile: The president and his opponents will be trying to manipulate public opinion until the end. If the public remains more interested in health care reform than "Whitewater," the President will get a bill passed and possibly a strong one. If the reverse occurs, I predict Bob Dole leads his troops away from health care reform, John Chafee's plan included.

Access to Health Care: Cost Is the Primary Barrier

Max L. Powell, III

The early development of health care financing mechanisms in this country provided nearly unlimited access to health care services. Until fairly recently, most of us were covered by fee-for-service (FFS) indemnity type plans that essentially unbundled the financing mechanism from the delivery of care. We made a decision as to which insurance carrier we preferred and completely separate decisions about which providers of health care we wished to use. The only relationship between the former and the latter was that the insurance carrier is where the provider sent their bill.

In recent years, managed care plans such as health maintenance organizations (HMOs) have attracted many members from traditional FFS plans, and that trend is continuing. HMOs use a number of strategies to maintain comprehensive benefit programs while more effectively controlling costs for their customers. In addition to the traditional utilization review activities, many HMOs

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The signs at present are pointing toward watered-down reform—perhaps less so regarding universality than cost-containment. This is unfortunate. The results will be more bureaucracy, more corporatizing of care, less consumer choice, less provider autonomy, and the prospect of revisiting this problem again in 5 years. (The crisis won't wait the usual 20 or 30 years between reforms.)

We will know significant reform when it comes, regardless of what it's called. It will provide us a system that unfetters the caregiver to fully advocate for the patient, gives the patient a choice of provider, and has the proven ability to contain costs so that patients have access without fear of financial ruin, and both private and public sector budgets are not undemocratically diverted. If that is truly what we want, I trust that in the long run, we will get it.

... unmanaged access to health care services will continue to generate unacceptable cost increases while managed access can produce cost savings that may enable us to meet our objective of providing universal coverage.

require that access to health care services be managed through a primary care patient manager (gatekeeper). Increasingly, HMOs are also utilizing selective contracting as a means of obtaining better pricing from health care providers and are limiting their network of both hospital and ancillary health care service providers.

These strategies have raised concerns about their potential to limit access to health care services. Some of these concerns have surfaced in proposed legislation that, if passed, would significantly reduce the ability of managed care plans to selectively contract or utilize primary care physicians as patient managers. One proposal vests almost unlimited judgment in the hands of the patient with regard to the necessary use of hospital emergency room facilities, one of the most expensive and least effective settings for the delivery of care.

One fact has been lost in all of this flurry of activity designed to maintain unlimited and unmanaged access to health care services—the fact that *cost is the primary barrier*. It is estimated that more than 37 million Americans do not have health insurance coverage on a continuous basis. For many of these people, the cost of health benefit programs has simply exceeded their

ability, or that of their employer, to pay for them. Until the mid-1980s, traditional health insurance programs experienced annual cost increases that frequently exceeded 20%. Even today, most forecasts expect our national expenditures for health care services to exceed \$2 trillion by the year 2003 as a result of a continued 9% annual rate increase. Health care expenditures are expected to absorb 20% of our gross national product by the year 2000.

President Clinton has recognized the need to address this problem and has made it a top priority of his administration. The administration's goal is to reduce this annual rate of increase to 6% and use the savings to help cover people who are currently without the financial means to pay for health care services. Managed care plans are expected to play a major role in this strategy. Several other health care reform proposals are based on the same general concept referred to as "managed competition."

The Group Health Association of America (GHAA) and KPMG Peat Marwick recently completed an analysis, *Trends in Health Insurance*, that indicates that, from 1988-1993, HMO premiums increased at an annual rate of 2 to 5 percentage points below FFS or Preferred Provider Organization (PPO) premiums. This means that HMO premiums increased 40% less than FFS premiums and 32% less than PPO premiums during the 5-year period of the study. These trends occurred while HMOs were able to continuously offer richer packages of benefits than FFS plans. Table 1 is a 5-year trend comparison:

Table 1.—Annual Premium Increases

	HMO	FFS	PPO
1988	8.0%	11.0%	17.0%
1989	16.0	20.0	18.0
1990	16.0	17.0	15.0
1991	12.0	12.0	10.5
1992	9.8	11.0	11.1
1993	7.7	9.1	7.2
Average	11.6%	13.4%	13.1%

Source: KPMG Peat Marwick 1993, 1992, and 1991 Surveys of Employer Sponsored Health Benefits; HIAA 1990, 1989, and 1988 Health Benefits Surveys.

The performance of HMOs in controlling costs has not been accomplished without placing some restrictions on access to health care services, compared to FFS plans. However, during this 5-year period, the commercial enrollment market share of FFS plans reduced from 71% to 49%. During the same period, enrollment in managed care plans of all types increased from 29% to 51%. In 1993 alone, national enrollment in HMOs increased by 3.5 million, to reach 45

million. These trends would seem to indicate that consumers who make decisions about health benefit programs accept managed access as a reasonable trade-off to lower annual increases in premiums.

There may be legitimate concerns that access might be unreasonably restricted in the pursuit of cost reduction. In Rhode Island, the Health Department is charged with the responsibility of approving HMO networks and utilization strategies to assure a reasonable balance between those objectives. We support both legislation and regulation that would strengthen this role as necessary, and make it applicable to all

managed care organizations.

Nevertheless, it is clear that health insurance purchasers have accepted the fact that they cannot have their "cake and eat it too." They have come to realize that unmanaged access to health care services will continue to generate unacceptable cost increases while, managed access can produce cost savings that may enable us to meet our objective of providing universal coverage. Let us hope that the legislative process comes to the same conclusion and rejects proposals that mandate the continuance of a singular philosophy of financing health care services that we can no longer afford.

The New World Order In Health Care

H. Denman Scott, MD, MPH,
FACP

The intense national concern about health care may well issue in a new world order in how the US delivers health services. In this paper I discuss the reasons for change, the sources of change, the nature of change, and the pace of change. What finally happens will depend on many complex factors and on how we answer questions about health care as a "right," about personal and financial responsibility for health, about the purposes of health care (individual well-being versus the general public health), and about the locus of power in the health care system (public, central versus private, local).

Reasons for Change

Costs

Why not spend 20% or more of GNP on health care? I hear this question frequently from physicians and others. What is wrong with spending activities designed to help people cope with illness and injury? The answer is that the expanding health care economy finds itself in competition with other things on which the society would like

All citizens, except the poor, must be required to make a contribution for health care. And given the fact that we all expect health care at one time or another, it is logical that there be no free riders.

to spend money. This is true of all levels of government and of many sectors in the private economy. Organized labor also sees rising health expenditures as eroding income growth. Thus cost is a prime, if not the principal, stimulus for change.

The absolute level of spending is awesome (nearly \$900 billion in 1993), but it is not as important as the rate of rise in expenditures. Because the health economy has been expanding more rapidly than the general economy it is consuming an increasing fraction of the GNP—and at a tempo that is alarming many people in high places.

Access

As costs have risen, access to care has become increasingly difficult for many people. A major objective of employers, governments, and individuals has been to devise strategies to avoid costs. This has resulted in much dysfunctional behavior. Competition in health care in the '80s and early '90s has become competition for the well and avoidance of the sick or those at high risk of illness or injury. The practical consequences have led to the phenomenon of "job lock," which makes a person with diabetes fearful of changing jobs because a new employer's health insurance might exclude the person from coverage or require a super high premium. Thus avoiding risk rather than spreading risk has become common practice.

Shifting costs has become another regrettable practice in the health care environ-

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ment It seems to occur in all settings bedeviled by rising costs. State governments seek to increase the federal Medicaid match; the federal government seeks to lay more long-term care costs on the states, private insurers pay a surcharge for government rates that do not cover costs, small employers who carry no insurance indirectly shift costs to large employers, employers require that employees pay a higher proportion of their health insurance premium, and individuals who carry no insurance and incur large health care bills lay this cost back on society as a whole.

These practices, avoiding risk and shifting costs, themselves consume time, energy, and money, and have contributed to health care's administrative morass.

Value (Quality)

Value is the product of quality and price. Because many studies have shown wide variations in practice and a high fraction of unnecessary care, there is a sense that quality is unacceptably uneven and that many Americans are not getting good value for their money.

Value is also compromised when preventive services are foregone or proper care for chronic disease deferred. People without health insurance do not feel welcome in the system and, as a result, commonly suffer serious health consequences: communicable disease, premature infants, premature strokes, to name a few.

Forces for Change

Forces for change come from the public, the health professions, employers (large and small business), and government. These various sectors of society are impelled by the reasons for change (cost, access, and value) to differing degrees. Working people, generally well-insured and insulated from many health costs, see more and more examples of people like themselves losing jobs, losing benefits, and facing catastrophic health costs. Many with health problems are afraid to change jobs because their pre-existing conditions will prevent their getting benefits in another work setting—so-called job lock. The elderly, generally well-covered by Medicare, are bedeviled by rising Medigap premiums, by rising medication and long-term care costs. Thus the public is worried about losing what they have, is pressed by rising out of pocket costs, and is beginning to question the value for dollars spent. The health professions increasingly see the consequences of lack of access: foregone and deferred care, needless use of expensive acute care, and many examples of inappropriate care. More and more professional societies see the need to

stem the rate of increase in health costs. Employers large and small are primarily motivated by rising costs. Those who provide health insurance are moving aggressively to control costs; those who do not provide insurance are digging in their heels against any requirement that they must pay for it. They believe such costs would imperil their ability to continue in business. State, local, and federal government have budgets busted by the demands imposed by Medicare, Medicaid and by the uninsured. Health care has clearly arrived as an unavoidable part of the legislative agenda.

While these various sectors of society give somewhat different weights to each component problem, they are all beginning to see that they are intertwined and cannot be addressed independently. As costs rise, access worsens. As access worsens, more people defer care and have illness treated in an advanced stage rather than in an early phase. As costs rise, public and private bureaucracy expand to deal with the costs. Rather than controlling them, they often add to them and in the process massively intrude into the daily clinical decisions of physicians.

The pace and nature of change will depend on how these forces converge and whether they can generate the power needed to overcome the massive inertia contained in the vast American health care enterprise. \$900 billion flow in relatively predictable channels. Reform that suggests new channels for the money will meet resistance. Reform that promises to reduce complexity will also threaten many jobs created to cope with the complexity.

Key Issues in the Debate

What occurs in health reform will depend on how several key issues are decided.

How will power be shared? How should the health system be organized? Is health care a right? If it is, what are the reciprocal responsibilities? What is the purpose of health care?

Power

Power is not commonly discussed in public debate about health care; yet power is a central part of the debate. Who will control the money and who will write the rules are prime questions. Will the nation continue to have shared power between the public and private sectors or will government take control of all the money and write all the rules? Will a managed competition model, based mainly on private sector initiative, become the norm or will the nation move to a single-payer model, or will the system evolve into some sort of hybrid?

A single-payer system, modeled after Medicare, would concentrate enormous power in the federal government. Congress would, as it does with the Medicare program, tend to micromanage the entire system. This model has great confidence in man's ability to understand complex systems, diagnose malfunction, pass laws, and write rules to correct all the problems. Ideally reason and data should guide the decisions. However, in a highly political environment special interests and money often have inordinate influence on what happens.

A managed competition model would give health plans, composed of doctors, hospitals, and insurers, considerable power over the structuring of delivery systems, managing resources, and setting capitated prices for a defined national benefit package. These plans would compete for business based on the price and quality of their services. The market (individuals choosing some plans and rejecting others) would de-

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termine which plans succeed and which fail. Assuring that the market operates on the basis of price and quality (something that has not happened to any major degree in the past), would require the oversight of a national health board. The function of the board would be to set broad rules that would allow the market to operate as it is intended. Corrective forces would operate at the market level. Rather than attempting to write a rule for every conceivable problem and set a fee for every service and procedure (as Congress now does for Medicare) the board would define the "rules of the game." Such rules would include the definition of the uniform benefit package, standards of accountability for quality, and regulating the physician work force to restore the balance between generalist and specialist physicians. It would serve, if you will, as a macro manager rather than a micro manager. In this system there would be a central authority, but most of the action would take place within health plans in local communities. Power would be significantly decentralized and vested in the private sector compared to the single payer model.

Under the Clinton health plan there would be a hybrid model. As in managed competition, health plans would be encouraged to compete on the basis of price and quality. However, the national health board would possess regulatory authority to set a national health care budget. Enforcement of the budget would be carried out by the states. The states would be authorized to set fees and capitated rates that would enable them to meet the budgetary goals. Such authority is necessary, the sponsors argue, because competitive forces alone will not be sufficient to stem the rise in health expenditures. Managed competition advocates argue that such power would undermine the competitive market, and the system would lapse into a regulatory mode with government making all the important decisions.

Organization

The traditional solo, small group fee-for-service practice of medicine is under siege; yet this style of practice remains dominant in many parts of the nation. A recent survey of the ACP membership showed that two-thirds of physicians worked as solo practitioners or in single specialty groups of fewer than 5. However, given the trends in Oregon, Southern California, Michigan, and elsewhere, this balance is beginning to shift rapidly in favor of organized networks of physicians and hospitals. The force behind this comes mainly from business, which is determined to bring health costs under control. Governments, particularly the state Medicaid programs, are also

developing managed care models. The logic behind this movement is that organizing care for a defined population will bring greater efficiency, better quality, and reduced costs.

Paul Ellwood and Alain Enthoven describe the organized systems of care as accountable health partnerships (AHPs). They call on components of the system (insurers, doctors and hospitals), which have been traditional rivals or even antagonists, to become partners to become an effective, competitive health plan. Insurers need competent doctors and hospitals. Doctors and hospitals need the capital, actuarial expertise, and information systems possessed by the insurers. Putting all this expertise under one umbrella allows an organization to define what it will cost to care for a patient population of given characteristics and recruit individuals to the plan. This approach also orients a plan to thinking about meeting the health needs of a defined population. It makes obsolete many providers' current obsession with filling hospital beds and appointment books.

With proper motivation and diligence this approach has great merit. However, there are some real risks to professionalism. Large organizations can become dominated by financial concerns, and insurance com-

pany money. Corners can be cut; inappropriate clinical guidelines promulgated, and profiles of care suggesting a quality problem ignored. Finally private bureaucracy can become every bit as choking as a public one. To guard against these risks the governance structure of the organizations must empower doctors, hospitals, and other providers. As the debate moves forward on organization, these concerns must be kept in mind.

Rights and Responsibilities

Many voices in our society proclaim that health care is a right. It clearly is not as evidenced by the millions who are uninsured. Health care is, however, an expectation of most everyone at some time. It may be only at times of major emergency, but the expectation, nevertheless, is there. The uninsured do show up for care when very sick or injured—usually in a hospital emergency room. While the care of the uninsured is deficient in many ways, what they do get is paid for in one way or another.

The nation's mechanisms for dealing with these expectations are very dysfunctional and very stretched. As already noted, much time and money is spent on trying to avoid the costs of the uninsured, and much time and money is spent dealing with illness

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that could have been prevented all together or avoided by proper management of chronic disease. Also, there is no requirement that all people who expect health care contribute to its financing. This lets many people and businesses with the means to make a meaningful contribution off the hook. They are free riders, and there are millions of them.

If then the nation wishes to define health care as a right, it must also define the reciprocal responsibility to pay for it. All citizens, except the poor, must be required to make a contribution for health care. Given that we all expect health care at one some time, it is logical that there be no free riders.

How to apportion financial responsibility is also an important question. Many working people have comprehensive plans that are covered in full by their employers. This creates a sense that their health care is free to them and someone else's responsibility.

These people are of a mind that we choose, and someone else pays. This dissociation creates obvious incentive to overuse and not be mindful of value for dollar. This circumstance cannot continue. Individuals must have a sense that some of their own money is on the line and that how they choose their health plans will influence how much discretionary money they have for other things. This can be done by cost-sharing of the premium and cost-sharing at the time health services are used. It will likely be necessary to have some of both in order to properly sensitize individuals to the costs of health care.

The Purpose of Health Care

The American health care system has focused on individual well-being; it has not paid much attention to how its collective

activities have contributed to the public health. It is proper that physicians focus on individual patients: how can their ailments be cured, how can suffering be relieved, how can function be restored. In recent years physicians have become increasingly interested in keeping their patients well via disease prevention and health promotion. This is an important development and it logically leads to a concern of how a doctor assures not only individual health but also community health.

If the nation becomes serious about health care making a concerted effort to assure the nation's health, there must be an unequivocal commitment to disease prevention and health promotion on a much larger scale. While there is much lip service in this direction, will there be the financial commitment when the final bill is passed?

Health Reform: the Rhode Island Angle

Charles B. Kahn, MD

How does one successfully fix a budget when such a high proportion of our health care costs relate to the ever-increasing elderly population and to the awesome societal ills of alcohol, tobacco, substance abuse, AIDS, violence and air pollution?

"There is a tunnel at the end of the light."

President Clinton outlined the 1334-page, 250,000 word Health Security Act of 1993 to Congress on September 22, 1993, and Senate Majority Leader Mitchell and House Majority Leader Gephardt introduced the bill, S 1787 and HR 3600, on November 20th. There are 100 original sponsors in the House and 30 in the Senate, including Senator Pell. In anticipation of this event, and in response to the so-called secret draft copy "for your eyes only," which was seen by millions of eyes, and now with the document in hand, much activity has taken place for over 1 year, and much more is about to take place. Opinions, editorials, reviews, seminars, fora, fauna, and commissions using all aspects of the media, locally and nationally, as well as through the governmental and public sectors, all are attempting to understand and/or influence the outcome of the plan. Battle lines are being drawn up. Protagonists, antagonists and nontagonists

are identifying themselves.

Several other plans have also been formally submitted to Congress for deliberation in 1994. These include the Chafee/Dole Republican Task Force, Health Equity Access Reform Today Act, S1770; the McDermott/ Wellstone single payer, American Health Security Act of 1993, HR 1200, S 491; the Cooper/Grandy/Breaux/Durenburger market-based, Managed Competi-

tion Act of 1993, HR 3222, S 1579; the Gramm/McCain, also market-based, "don't fix what works," Comprehensive Family Access and Saving Act, (to be submitted); the Nickles/Steams consumer-oriented, Consumer Choice and Personal Health Security Act, S 1743, HR pending, and the Lott/Michel also consumer-oriented, Affordable Health Care Now Act, S 1553, HR 3080. And others.

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There are several aspects of the Clinton plan that have a particular bearing on the general economic and health care climate in Rhode Island. The AMA's Health Access America and its Patient Protection Act remain RIMS' guideposts for our position statements.

The first aspect relates to the emphasis on primary care. The AMA recognizes the importance of workplace reform and primary care in molding a new system but has not yet established a policy on this matter. As outlined in the *American Medical News* of December 20th, AMA task forces are meeting on primary care and workplace reform and are expected to report at the June 1994 annual meeting.

The appropriate term should be the primary care physician, the physician who is responsible for first, basic, comprehensive (primary) care of the patient and responsible for directing and coordinating care if the other specialists are necessary. The term gatekeeper bothers me greatly. This not a term found in medical dictionaries and carries economic not health care connotations. Gates are either ornamental or are meant to be kept closed. A gatekeeper reminds me more of a security guard.

There is an inadequate supply of primary care physicians. Also there exists a negative environment for such physicians to practice in our state. Reimbursement rates are among the lowest in the country, and overhead costs high. Recruitment and retention of primary care physicians is a real problem even though Memorial Hospital of Rhode Island has a nationally recognized family practice primary care training program. Fairer reimbursement, use of the RBRVS guidelines, less hassle, broadened loan forgiveness or repayment programs and adequate capitation for the new Medicaid reform legislation will be helpful. RIMS has specifically requested extending the scope of the state loan repayment program and will seek amendments to the federal legislation through our Congressional delegation. The health centers must also survive in a healthy status as critical primary care providers for special segments of our population. The role of medical specialists carrying out primary care for some of their patients with chronic illnesses within their scope of practice needs to be seriously considered. The medical specialist must be willing to follow the accepted guidelines for providing primary care for that selected group of patients. This expands the pool of primary care providers and can contribute to the ultimate goal of high quality, medically necessary, cost effective health care. Some subspecialty societies have termed this "principle care." United Health Care of New

England was identified in a recent newsletter from the American Society of Internal Medicine (ASIM) as one of the first insurers to restrict the scope of practice of medical subspecialists and in most instances prevent limited primary care. ASIM with a large general internal medicine membership is vehemently opposed to such restrictions.

Choice is, and will be, most problematic. United Health of New England, as already indicated, and Healthmate 2000 have already made major moves affecting choices. The Clinton(s)' plan promises meaningful choice for patients and physicians. A headline in the *American Medical News* in November reads, "It all depends on what you mean by choice." The interpretation of what the Clintons mean by choice is the recommendation, with some exceptions, that the health alliances allow several providers to participate and that each provider allows several types of plans, including at least one fee-for-service option. Physicians must be allowed some choices as willing providers and patients must also have realistic choices. As proposed, however, the playing field is far from level. The tilt is so far in the direction of managed care that fee-for-service or point-of-service options may not be real choices at all. Taxing patients who choose to seek care and pay privately outside of any plan is most unacceptable and egregious. Fee-for-service should be more costly, but the costs need not be excessive. Competition between choices within a plan can be helpful and the lower cost estimated for managed care may well be underesti-

ated. The AMA has also recommended that the payer cover the same percent (eg, 80/20) of any acceptable plan. Realistic, meaningful choice should be the guiding principle.

A balance must exist in affordable health care, including costs, patient care, donor/patient relationship, quality and choice. RIMS considered submitting a bill to the 1994 legislative session on any qualified physician (MD or DO), willing to join a plan and play by the rules.

How to pay for the new Clinton plan remains complex and problematic, and many economists are concerned that the costs have been sorely underestimated. The *American Medical News* recently pointed out that "the future of the trillion dollar health care industry could hinge on phantom numbers—'guesstimates'—using improper economic models for untried delivery systems." RIMS is very concerned about the reduction of \$238 billion from Medicare and Medicaid reimbursements and the shift these dollars to help pay for the plan. This proposal carries great risk if the so-called savings expected in the plan do not offset these reductions. RI has the second highest per capita elderly population and with the caveat that the new reform legislation is yet to be tested, has a Medicaid plan with the lowest reimbursement schedule in the country and one that is in financial chaos.

The employer mandate is supported by the AMA as a matter of policy, but this policy was amended at the recent interim meeting to include a more flexible pluralis-

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tic approach to the payment of health insurance. Single payer is not one of the choices. In our state, with such a large percentage of small businesses, the 80/20 employer mandate proposal could have a very adverse effect on survival of such businesses, weakening the very foundation of our economic health. Vermont is evaluating a 50/50 split in employer/employee contributions. Greater participation by the individual through individual insurance selection and ownership, medical savings accounts, medical IRAs and appropriate tax safeguards enhances the responsibility of the individual in seeking cost effective, high quality health care. Hidden also in the cost of the plan is the little discussed cost shift to state government required by the plan to establish and maintain the health alliances, and in RI (one of 10 states) the concern that the state's contribution to its employees' health plan will rise above the ceiling of 7.9% (estimated to be 10%).

A global budget is a key element for cost containment in the Clinton plan. Health care adapts poorly to fixed budgeting. How does one successfully fix a budget when such a high proportion of our health care costs relate to the ever-increasing elderly population (very much affected by successful preventive health measures) and to the awesome societal ills of alcohol, tobacco, substance abuse, AIDS, violence, and air pollution? Some estimates suggest these "ills" account for more than \$300 billion per year. Guidelines for spending must be part of reform but adjustable, realistic spending targets are workable and make more sense. Strict budgeting must lead to rationing. Nothing in the Clinton plan addresses the issue of rationing. Rationing is defined by the AMA as "a process of allocating health care resources that result in limitations or denials of medical services."

Malpractice or tort reform is an essential part of the Clinton proposal. The plan has offered a serious beginning but only a beginning. The costs associated with malpractice insurance, case adjudication and defensive medicine have a great impact on health care costs in RI. Most are unaware that only 40 cents of every dollar awarded in a malpractice case reaches the plaintiff. The remaining 60 cents pays legal costs and more particularly, legal fees. Estimates suggest legal and defensive medicine costs more than \$180 billion per year. *Forbes* recognized Rhode Island for the dubious distinction of having the second highest frequency of liability suits in the US. Malpractice leads that list. The Clinton recommendations need to be strengthened to include a cap on noneconomic damages and a "sliding" scale for attorneys' fees. A 33.3% limit

on legal fees is no limit at all. A tested, workable malpractice reform plan exists in California. MICRA should be used as an important framework for tort reform. The Maine experiment on providing an affirmative defense (holding physicians blameless) for physicians who follow practice guidelines is intriguing. Enterprise liability is an unacceptable proposal.

In the same vein, meaningful antitrust reform is crucial. Physicians in a procompetitive way must be allowed to group together and participate in negotiating fees, costs, quality and the nature of the delivery of care unencumbered by our present onerous antitrust restrictions and penalties. Therefore, RIMS has supported the Hatch-Archer bill and the Canady amendment.

The issues of health care system reform have a serious and significant impact on medical schools, on graduate medical education and on basic and clinical research. This impact will be felt locally at Brown Medical School, which has had such a critically important, positive effect on the delivery of health care in Rhode Island. Adequate funding of undergraduate and graduate medical education, including those fellowships which by necessity must survive, and funding of research are in jeopardy, and the negative impact could be severe. An area of particular concern is the mandate that 50% of medical school graduates indicate an intent to enter primary care and that

postgraduate training programs mirror this policy. If the mandate is violated, financial penalties will follow. Also federal education loans to medical students have been or will be limited to a commitment to enter a primary care track.

AMA Trustee William Jacott called the mandate "a federalization of medical education." The driving force should be a desirous practice environment and willing players, not a mandate which undoubtedly will have to include unwilling players.

The final two areas of concern include the role of health care extenders and medicine as a business. If a primary care model of affordable universal health care is achievable, nonphysician, mid-level, limited license health care extenders will be necessary. Such participation must be under the direct supervision of physicians and not be allowed to practice primary care medicine alone and unsupervised. Nursing, optometric, chiropractic and other organizations are pushing hard to gain greater independent practice roles and independent payment schedules. The American Nurses Association is taking the most aggressive action to increase the independent scope of practice for advanced nurse practitioners, which include nurse practitioners, nurse midwives, nurse anesthetists and clinical nurse specialists. The AMA board of trustees recently presented a 30-page position paper on advanced nurse practitioners.

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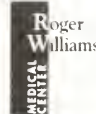
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The issues of medicine as a business are complex. In my down moments, health care seems to be treated as a commodity and the health care system as a public utility. Professionalism appears to be fading, and physicians are becoming tradespeople. I try hard to forget these perilous daymares and

convince myself that such will not happen. The AMA, in a revision of the 1994-96 Strategic Health Policy, identifies professionalism as one of six critical major issues.

Sir William Osler advised his students nearly 90 years ago: "You are in the profession as a calling, not as a business; as a

calling which extracts from you at every turn self-sacrifice, devotion, love and tenderness to your fellow-man. Once you get down to a purely business level, your influence is gone and the true light of your life is dimmed." Is this advice an epiphenomenon and unrealistic in the new health care era?

Health Security for America: A Rhode Island Perspective

James P. Crowley, MD

My perspective on this problem has been shaped by the land and time in which I live and by people I have met in life. And, of course, by my profession. As I thought about these various influences I was surprised to realize how far back in time they extended. And at the end of this exercise I was gratified to find that the effort to think through the sequence of events that brought us to health care reform in 1994 had been worthwhile and helped me clarify my thoughts on this subject. While my fears about the future have certainly not been swept away, reflecting on the roots of the problem has given me hope that the effort to reform health care in America is something that logically follows previous improvements in health insurance and something that deserves physicians' support.

The year 1936, was 7 years before I was born. My father's first cousin had just finished his residency. He opened his office in his home, and he took a night job as a bookkeeper to earn money to buy furniture to outfit a room in his home for his first child. Rhode Island was in the grip of the Great Depression when almost 30% in this state were unemployed. Rhode Island was hardest hit of any state, probably because its traditional industries, worsted and cotton weaving, were leaving the state for the upper South on a grand scale. Many in this state were destitute. Only the charity of friends and family was available to sustain them when they lost their savings and their jobs. In 1940 an unexpected opportunity arose, and my father's cousin moved his practice to take on the practice of a retiring physician. His second attempt at practice was more successful because the onset of World War II had finally ended the massive unemployment in New England, and ship

building and repair boomed in the area along the southern coast. He was one of the first physicians in his area to use penicillin to treat pneumonia and cortisone to treat rheumatoid arthritis. The financial uncertainties when he started his practice were greatly eased by employer-sponsored in-

surance, which guaranteed that the patients would be able to afford necessary treatments. Through him, I came to appreciate the value of social security, and private health insurance and through him I became interested in a career in medicine. But health insurance meant hospital insurance and even

In my opinion, only physicians are competent to make quality judgments about medical care.

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James P. Crowley, MD, is professor of medicine at Brown University School of Medicine and director of hematology at Rhode Island Hospital, Providence.

that was limited to those who had jobs.

By 1964 I was now in my third year of college. John F. Kennedy had been gunned down in Dallas just 1 year earlier. The nation's attention was now turned to reform of health care for the elderly. The premedical society I belonged to had sponsored a debate on whether the Medicare bill that very year before Congress would be good or bad for the country. I volunteered to argue the affirmative because I had the good fortune to know the bill's sponsors personally.

The bill in Congress had been co-sponsored by Rhode Island's longtime representative, John E. Fogarty, and an admired and respected family friend. However most of the credit for Medicare went to Rhode Island's other member of Congress, Aime J. Forand from Woonsocket, who had been fighting for a health insurance plan for the elderly for most of his congressional career. He and Senator Theodore Francis Greene, who also supported the Medicare bill, were two of Congress's oldest members, which personalized their role in this legislation. The argument that they advanced was the simple fact that many of the elderly had no insurance since they had come through an era when employee-sponsored insurance often could not be carried into retirement. Insurance came through your job and for many of the elderly of that period no job meant no insurance.

I bolstered my arguments with statistics from other developed countries of the world that showed conclusively the United States was the only industrialized country of its size without health care insurance for its elderly citizens. My opponent in the debate argued that Medicare for the elderly was the first descent down a slippery slope to socialized medicine and a small step toward communism. Despite the liberal atmosphere of the times, the charge that something was tending toward communism was a very potent negative. My opponent won the debate. Nevertheless, Congress passed the Medicare Act in 1964, and it quickly won wide acceptance among the elderly and among physicians. The prediction that Medicare was the first step toward communism never came true. However, Medicare did cover outpatient services and health care insurance as was seen more than hospital care. This was the beginning of the movement toward comprehensive health insurance in this country.

By 1975, I had finally finished my medical training although most of what I know now I didn't know then. In the interval since the passage of Medicare, I graduated from medical school and followed my cousin's footsteps into medicine but in a much more

favorable economic climate. The incomes of physicians and surgeons rose steadily over the period 1965-75 as they provided more and better services. An increasing fraction of the population was insured and able to shoulder the costs that the advances in medicine required. The health needs of Americans were being successfully and efficiently met by the increased efforts of physicians and surgeons despite the growing and expensive body of technology and the introduction of highly specialized care at all levels. The longevity of Americans steadily increased. However in Washington there was concern about the increasing expense of the Medicare system. Alternatives to conventional insurance were promoted in Congress by powerful liberal advocates such as Senator Ted Kennedy. Kennedy particularly favored so-called health maintenance organizations (HMOs) that would have a strong incentive to prevent disease. HMOs controlled costs by removing any financial incentive from the provider to

render any services that were not essential since the providers were all salaried. And because of their size they successfully bargained for discounts for their pharmacies and for hospital costs. One of the oldest of these organizations was Rhode Island Group Health Association (RIGHA), originally founded by state labor leaders as a way to provide low-cost health coverage to union members.

RIGHA remained a low budget operation located in a small building behind the Our Lady of Fatima Hospital until the early 1970s when Congress passed laws giving qualified HMOs special funding for expansion. Expansion in Rhode Island was rapid but as the free standing RIGHA buildings began to appear in various parts of Rhode Island, local physicians became anxious about their future and eventually an HMO that incorporated private physicians was formed, the Ocean State Health Plan. This home grown HMO seemed instantly successful at least for a time. In the meantime,

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the traditional indemnity insurer, Blue Cross, experienced an increase in its costs and raised its premiums repeatedly in response to the loss of younger working people who increasingly took the less expensive HMO options now available in Rhode Island. However, small Rhode Island-based HMOs could not properly manage their rapidly growing organizations nor did they have the financial reserves to weather periodic excessive losses.

By 1992, both of the small Rhode Island HMOs had been incorporated into larger entities from outside the state, but their growth within the state continued to increase substantially. This only served to intensify competition with the traditional indemnification programs. Physicians began to feel the pinch of managed care in their day-to-day practices as they either lost patients or were subjected to increasing restrictions by insurers in Rhode Island. Many young practitioners, especially primary care physicians saw their incomes steadily erode. Some began to leave practice to join HMOs, and others left to practice in less restrictive environments. It was just at this time that President Clinton's proposal for revamping health care was first rumored and then announced in September 1993. The cornerstone was universal comprehensive coverage. It will mandate a choice of at least one closed panel HMO, an open panel HMO and access to fee for service at premium charges in an employer-financed system in which employers are grouped in large health alliances that negotiate with health care providers to reduce costs. Benefits are generous and exceed the average policies now offered by employers. Savings will occur for employers as health care costs are lowered as the insurance providers compete for business and eliminate waste. Quality would be maintained by mandated peer review and outcome analysis. Expenses will be controlled by premium caps that will become unnecessary as the cost of health care is reduced by the increased competition among the managed care plans. The last point was the most difficult and remains the most controversial aspect of his proposal. Still, most close observers of the politics of health care reform thought the Clinton plan was a masterpiece of political design. It at once avoided the single payer system that the average citizen would mistrust, and it promoted competition as a way of bringing costs down. Clinton's political enemies grumbled that he was taking their fire away from them but the least partisan openly praised the plan for its comprehensiveness and the President and his wife received universal acclaim. Under the leadership of Senator Chafee a

sort of loyal opposition was formed that embraced most of the Clinton principles: security, simplicity, savings, choice and quality but differed in placing the funding responsibility on individuals rather than employers and phasing in the plan gradually matching expansion to savings thus avoiding caps on spending.

In 1993, physicians' reactions to the plan varied greatly depending on how they say the plan affects them personally. One member of my family is a pediatrician in a closed panel HMO. She isn't worried about the Clinton plan, because she believes the system she works in rationally eliminates waste in medical care. But it does so with physician participation in the process at all levels. And her system of practice does not have as much of a financial imbalance between specialists and primary care physicians as is seen in all other forms of health care delivery. She has pointed out to me the clear consensus among all health care economists that the closed panel HMO is what

makes the best economic sense. When we discussed this issue, I pointed out to her that while some Americans are interested in the most efficient and least expensive system, participation in closed panel HMOs has been level. This was because most people in this country still preferred as much choice as possible, her positive experience with her patients in a closed panel HMO notwithstanding. Moreover, while closed panel HMOs are the first choice for many patients and many doctors, it is possible that they will remain so only as long as there is some competition to keep their bureaucratic administrative structures lean.

So it is now 1994 and Rhode Islanders born this year may fully expect to live more than twice as long as their forebears in 1794. It is a lovely early springtime after a long winter. Perhaps it is the uplift the season brings or perhaps it is the result of this enforced reflection on how much progress there has been in medicine since the days when my cousin first began his practice, but



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I am very optimistic about the prospects and consequences of health care reform for improving the health care of Americans. But which plan is the right one? It is noteworthy that no plan but the President's, to date, provides secure funding for population-based public health, which is the principal reason the diseases that killed our ancestors are not longer a threat to most of us. However public health threats continue to mount.

Certainly, the Clinton plan has been unequivocal in advocating universal coverage, which is fundamental to any true reform. People are worried most about his insistence over employer-based coverage, but he seems willing to compromise that arrangement. I feel employer-based health insurance financing is a system this country is familiar with and to totally retreat from it would be folly. Still, relief in the form of some subsidies will be essential if many small businesses are not to go under. The health alliances that Clinton proposes sound scary at first because they would create a new layer of bureaucracy, but purchasing cooperatives are a reasonable compromise in leveling the field among small groups and large groups.

I believe the most important element in

safeguarding the integrity of the new alliance plan that is missing in the Clinton proposal is not the issue of some sort of cooperative purchase plan but the issue of who will control its quality assurance. In my opinion only physicians are competent to make quality judgments about medical care and if the system relinquishes this to any other less qualified group quality will take a back seat to cost containment. While we need tort reform, absolute control of quality assurance by physicians is even more important for us.

Clinton's plan needs to be amended so that physicians and other health care providers are empowered to regulate their HMO associations by the elimination of the anti-trust provisions that limit such associations. Finally, although pronounced dead in many quarters, I think fee for service must still have a role, albeit limited, in the new order, particularly in some of the specialties. While some physicians who employ expensive technologies may have a potential conflict of interest in the fee-for-service setting in the sense that there is a financial incentive to provide services, this can be controlled through peer review. The problem of how to detect and monitor the under-provision of

services if physicians are given financial incentives to reduce their use of technology is much more difficult. As every physician who has served on peer review committees knows, sins of commission are always more easily detected than are sins of omission.

Despite our present anxieties, we are practicing medicine in the greatest country in the world today. Our ability to diagnose and treat patients has never been stronger. If we do not have the power to cure every illness, we do have the power to influence positively the course of almost every illness. But our health care costs are ahead of all other nations in the world while the results lag behind. Much remains to be done if everyone is to have an equal chance at a healthy life. Although Rhode Island can be proud that it leads the nation in the percentage of its citizens covered by some type of health insurance, a large number of low-income working people still have no health coverage, and many middle-class persons who have lost their jobs also fall into that category. More and more insurance companies drop patients because of lifetime limits and many individuals must pay extraordinarily expensive premiums because they have the misfortune of having some chronic

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ation to ensure that comprehensive, universal and secure health care coverage for all Americans now takes its place on that list.

The Intent of Health Care Reform: Health Improvement Through Prevention

Barbara A. DeBuono, MD, MPH

The main objective of health system reform must be to improve the health of the American people. This tenet is missing from the national debate that has been focused on cost containment and universal insurance coverage. Coverage does not equal care, and reducing costs will not ensure a health-

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ier population. The cornerstone of health improvement has been and will continue to be prevention and its main components: population-based activities that change behavior and reduce risk and the integration of clinical preventive services into the practice setting. The truth is that any health care reform plan that manages to increase access to health care and control costs will ultimately fail if it does not improve the public's health.

The opportunities for health status improvement in Rhode Island have been well documented in a recent report *Healthy Rhode Islanders 2000*, prepared by the Governor's

Inevitably, health care reform will be judged by the improvements it brings to the health status of the population.

Year 2000 Task Force and the Department of Health. This report contains 25 priority health objectives for Rhode Island aimed at increasing the span of healthy life, reducing health disparities and achieving universal access to preventive services. These goals include:

- Reducing the percentage of adults who smoke from the 1991 level of 25% to 15%.
- Reducing alcohol-related motor vehicle deaths from 5.1 per 100,000 population to 4.6.
- Reducing the proportion of unintended pregnancies from 35% in 1991 to 24.5%.

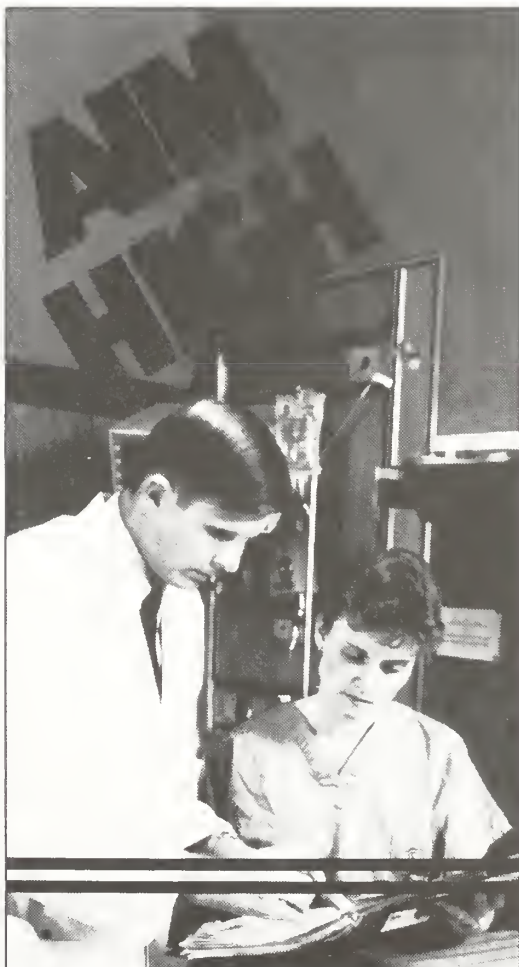
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The Governor's Task Force firmly believes that better distribution and targeting of available information, technology and resources over the next decade will allow us to attain the stated objectives of *Healthy Rhode Islanders 2000*. Achieving these goals will lead to all Rhode Islanders living longer and healthier lives. Health care reform must be measured by how well it makes this vision a reality.

We will fall far short of our goals if health care reform is limited to the private medical service delivery system and the health insurance industry. The solutions to the underlying problems of our current health care crises lie beyond the reach of medicine or economics. In a 1982 report, the Institute of Medicine concluded that only 10% of premature deaths among Americans could have been avoided through improvements in access to medical treatment. What is more important, 50% of premature deaths could have been avoided through changes in personal behaviors. High risk behaviors: tobacco use, high fat diet, sedentary lifestyle, alcohol and other drug abuse, violence and lack of access to preventive services, result in heart disease, cancer, stroke and injuries, which are the leading causes of death in our society. Many other health problems, such as the disabling effects of lead exposure, poor birth outcomes and HIV/AIDS, have reached crises proportions due to environmental, societal or lifestyle factors. To address these issues and to advance the health of Americans effectively, we must rely upon population-based services that focus on health promotion, community health protection, personal prevention and assistance in gaining access to care. This is the role of the public health system.

Population-based health services emphasize primary and preventive care and target health disparities. Health promotion aims to influence personal behaviors, thereby reducing the risk for disease and injuries. This is accomplished primarily through public education and broad-based informational efforts aimed at reducing or eliminating poor health habits and by promoting better health habits (eg, nutrition, exercise, safety belt use and prenatal care). These health promotion efforts are intended to make individuals more aware of the consequences of behavior and lifestyle choices and to foster personal responsibility for one's health. Community health protection means improving the social and physical environment to reduce exposure to health hazards. This involves the investigation and control

of diseases and injuries, and the protection of environment, workplaces, housing, food and water.

Personal prevention is *the* most effective tool available to public health. This involves promoting and assuring counseling services, screening and vaccinations. Despite their well-known benefits, the delivery of these services in our current health system is inadequate. Access to quality care has two components: the first is personal health services, such as home visits, primary care for underserved populations, and outreach and treatment for targeted conditions; the second addresses quality standards through the regulation and licensing of health care facilities and providers.

The core functions of public health—assessment, policy development and assurance—are the creative processes resulting in effective and efficient population-based health services. These activities involve assessing the community's health status and its available resources, developing health policies and programs to support and encourage better health, and assuring that nec-

essary, high quality, effective services are available. Performing these functions well requires dedicated resources that, to date, have been scarce for public health. This underinvestment must be recognized and reversed to achieve the substantial societal benefits and cost savings gained from this important investment in preventive health service delivery.

Inevitably, health care reform will be judged by the improvements it brings to the health status of the population. In Rhode Island, we are fortunate to have attainable and measurable goals for these improvements in *Healthy Rhode Islanders 2000*. As we look at the problems fueling our health crises, we see that the solutions lie in enhancing our population-based health services. Increasing support for the core public health functions is critical to achieving these necessary enhancements. Unfortunately, without this support, our population-based services will fall short, and the health care delivery system will be re-formed without improvement in the health status of our population.

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Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Diseases of Summer: EEE and Lyme Disease

Utpala Bandy, MD, MPH, and Edward Donnelly, RN, MPH

The warmth of Rhode Island's summer brings increased risk of two vector borne diseases, the rare but deadly Eastern Equine Encephalitis (EEE), and the common and controversial, but eminently curable Lyme disease. Both may be prevented; both pose challenges for control. (Other vector borne diseases of less importance in Rhode Island include tick-borne Rocky Mountain Spotted Fever, Ehrlichiosis, Babesiosis, and mosquito-borne *Dirofiliriasis*.)

EEE

EEE is a mosquito-borne viral illness of birds that caused epidemics among horses until the introduction of a specific equine vaccine. Human cases occur rarely and sporadically. EEE produces high morbidity (1 of 23 infected humans manifests clinical signs) and high case fatality (30% to 50%). Peak incidence occurs in July–October, related to mosquito activity.

Lifecycle

EEE virus initially infects *Culiseta melanura*, a freshwater mosquito that prefers swampy wetlands and preferentially feeds on wild birds. The virus replicates in birds, most of whom do not become ill. Less fastidious mosquitoes of the *Aedes* genus feed on birds, then mammals, transmitting the virus. Animal infections, particularly equine infections, frequently precede human outbreaks by several weeks and thus constitute important sentinel events. Transmission from mammal to mammal does not occur. EEE epidemics typically occur in the second year of 2 consecutive wet years, although other factors, such as temperature and avian demographics, also affect human risk.

Clinical Features

The virus replicates at the bite site, producing viremia in 1–3 days. After a 1–7 day prodrome of upper respiratory symptoms, malaise, vomiting and abdominal pain, the encephalitic phase begins with high fever,

headache, seizures and altered sensorium. Focal signs may be present, and the CSF shows a pleocytosis. The highest morbidity is observed in the very old and very young. A better longer prodrome (>4 days) is associated with better prognosis. Survivors often suffer permanent impairment.

A high index of clinical suspicion needs to be maintained and appropriate tests ordered in suspect cases. Confirmed diagnoses have grave implications for protection of the general public through timely public health responses.

Rhode Island, 1993

On September 13, 1993, a 14-year-old boy died at Rhode Island Hospital of a fulminant viral encephalitis, later confirmed by tissue culture to be EEE. On the weekend of August 27–28 he had camped on Block Island with his Boy Scout troop and reported being bitten by mosquitoes in a swampy area near camp. Everyone in the troop who consented was tested for EEE infection. One of these 16 had EEE IgM antibody but denied recent illness, confirming asymptomatic infection. Block Island was the only common environment shared by the two infected scouts during the incubation period.

The 1993 case was unusual in that surveillance activities had not indicated the threat of EEE. Abnormal vector activity was absent. Positive mosquitoes had not been found. Cases had not been diagnosed in birds or horses anywhere in the state. The summer of 1993 had been uncommonly dry. Finally, Block Island is not considered a suitable habitat to support EEE; it lacks the freshwater swamps with hardwood trees associated with EEE amplification.

Rhode Island Surveillance

The earliest seasonal identification of arboviral transmission in mosquitoes and mammals is an important element in detecting risks to humans. The State Mosquito Abatement Coordination Office conducts

trapping and testing of mosquitoes at 13 locations around the state from mid-June to the end of the mosquito season (the first frost). Specimens are tested at the Yale University arbovirus laboratory. Traps are placed in swampy habitats and where cases had arisen in the past. In addition, all equine cases are reportable to the state. Findings guide the intensity of public health response, varying from media alerts to area spraying with adulticidal mosquito agents.

Prevention Guidelines

The most important indicator of risk is vector biting activity. Most biting occurs at dawn and dusk or in the shade, when the temperature exceeds 50 degrees (especially when a warm period is preceded by a cool night), and when the air is still and humid. The following precautions should be taken when the risk of biting is high (throughout the mosquito season in coastal areas):

1. Make sure that window screens are in good repair.
2. Remain indoors at dusk.
3. Wear long pants and long-sleeved shirts.
4. Apply mosquito repellents containing DEET to clothing. Concentrations of DEET above 20% are unnecessary and may cause skin reactions. Repellents should not be used on infants. Children should be cautioned to avoid repellent in the eyes.

A vaccine for human use is available for high risk persons as part of an investigational protocol.

Lyme Disease

Lyme arthritis was first described in 1975 as a cluster of cases in three Connecticut River towns. Soon after, the disease was linked to the tick vector *Ixodes dammini*. In 1982 *Borrelia burgdorferi* was identified as the infective agent. The disease is now

ABBREVIATIONS USED

CSF: Cerebrospinal fluid
EEE: Eastern equine encephalitis

Table 1.—Late manifestations of Lyme Disease.

Musculoskeletal

- Recurrent, brief attacks of objective joint swelling
- Sometimes followed by chronic arthritis

NOT:

- Chronic, progressive arthritis without brief attacks
- Chronic, symmetrical polyarthritis
- Arthralgia, myalgia, fibromyalgia syndrome

Cardiovascular

- Acute-onset 2nd or 3rd degree atrioventricular conduction defects
- Resolves in days or weeks
- Sometimes associated with myocarditis

NOT:

- Palpitations
- Bradycardia
- Bundle branch block
- Myocarditis alone

Nervous System

- Lymphocytic meningitis
- Cranial neuritis, especially facial palsy
- Radiculoneuropathy
- Rarely encephalomyelitis alone or in combination (must be shown by higher titer in CSF than serum)

NOT:

- Headache
- Fatigue
- Paresthesias
- Mild stiff neck

recognized as an important public health problem. *Ixodes dammini* and Lyme disease are abundant in the Northeast from southern Maine to northern Virginia. Peak incidence occurs in the summer months.

Life Cycle

Ixodes dammini lives 2 years. Adult ticks feed and mate on large animals such as deer in the fall and spring. Female ticks detach and fall to the ground to lay eggs, which, in turn, hatch into larvae in the summer. Larvae feed on small mammals through summer, fall, and spring, then molt into nymphal ticks. Larvae and nymphs acquire *Borrelia* from small mammals, primarily the white-footed mouse. Nymphs quest for a single blood meal from the tips of vegetation. Feeding requires attachment of several days duration and transmission of infection cannot occur before 24–48 hours of attachment. After feeding, the nymph detaches and falls to the ground, where it molts into the sexually differentiated adult form, completing the cycle.

Most transmission to humans occurs from

nymphs during May to August. Their small size (about the size of a poppy seed) increases the chance they will go undetected for the 2 days of nymphal attachment necessary for *Borrelia* transmission. Larvae are unable to transmit the disease, and although adult ticks can do so, they seldom go undetected for 2 full days. In Rhode Island, 18% to 25% of deer ticks are infected. Human outdoor activities and risk of exposure diminish in the fall, when adults are active. The risk of tick exposure is greatest in woods and garden fringes, but is present in other outdoor areas and from ticks on pets.

Clinical Features

Lyme disease typically begins with a characteristic skin lesion, erythema migrans, from 3 days to 1 month after a tick bite. Associated fatigue, chills and fever, headache, myalgias and lymphadenopathy occur intermittently, sometimes followed by late systemic manifestations involving neurologic, musculoskeletal, and cardiac abnormalities if antibiotics are not administered in the early stages of infection (Table 1).

The Lyme disease national surveillance case definition was adopted in 1990 and describes a case as: a person with physician-diagnosed erythema migrans (EM) at least 5cm in diameter; or, in the absence of EM, a person with at least one late manifestation, with no alternative explanation, and laboratory confirmation of infection.

Rhode Island Surveillance

Rhode Island has one of the highest per capita incidence rates of Lyme disease in the United States. In 1993, Lyme disease

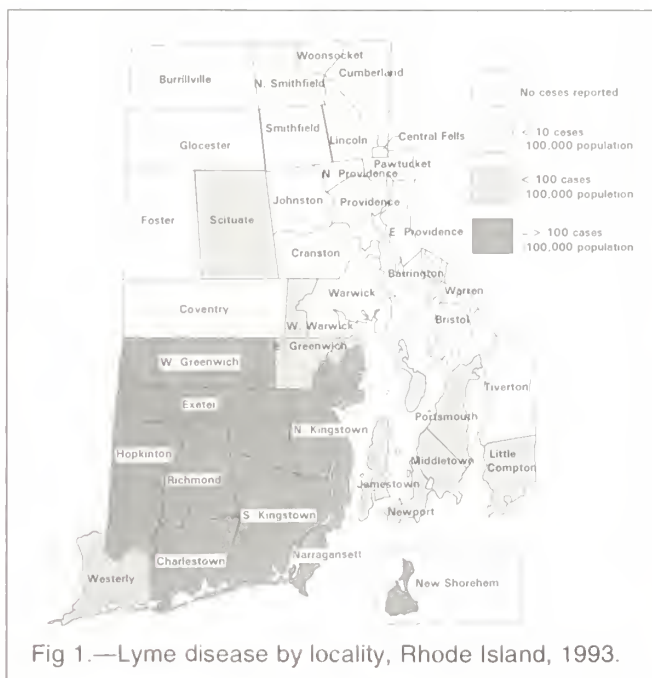


Fig 1.—Lyme disease by locality, Rhode Island, 1993.

was the most commonly reported communicable disease in Rhode Island (272 cases) other than sexually transmitted diseases. Figure 1 reveals the high risk geographic loci observed in the state. Seventy percent resided in Washington County, where only 11% of the state's population lives.

Statewide deer tick surveys were conducted in 1993 by the Center for Vector-Borne Disease, University of Rhode Island in collaboration with the Division of Disease Control, Rhode Island Department of Health. Infected ticks were found throughout the state, but were particularly concentrated in Washington County and the coastal islands, a distribution closely reflected by the distribution of human cases.

Prevention and Treatment Guidelines

Protective clothing is recommended in the spring, summer and fall, including long trousers, long-sleeved shirts, shoes, and hat, preferably of light colors to visualize ticks more easily. Two chemicals are effective in deterring tick attachment: DEET, an insect repellent applied to the skin, clothing, and shoes in concentrations of no more than 20%, or Permethrin, a pesticide applied to clothing and shoes.

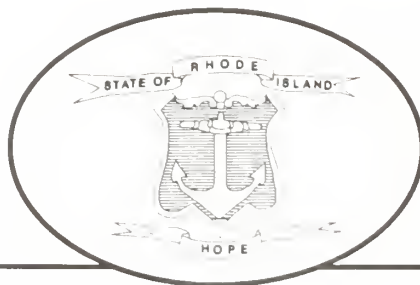
If a tick is found attached to skin, it should be gently pried loose with forceps, using a firm pull backwards. Any residual mouthparts should be excavated as one would a splinter. A 10-minute hot drying cycle in a clothes dryer will kill ticks by desiccation.

Only if an expanding erythema greater than 5cm appears should antibiotics be prescribed. *There is no role for prophylactic antibiotics.*

Table 2.—Laboratory confirmation of Lyme Disease.

- Isolation from tissue or body fluid
- OR**
- Diagnostic levels of IgM or IgG antibodies in serum or CSF
- OR**
- Significant titer change between acute and convalescent serum samples
- AND**
- Exclusion of causes of biologic false positives (eg, syphilis)

HEALTH BY NUMBERS



Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Rite Care Program Recipients and Expenditures

In July 1994, the state of Rhode Island began enrolling low-income residents in the new Rite Care health care program. Rite Care serves those who have been eligible for participation in the state's Medical Assistance (Medicaid) program plus uninsured residents meeting the program's requirements. Specifically, the Rite Care population includes:

- Medicaid beneficiaries who are eligible because they are enrolled in the Aid to Families with Dependent Children (AFDC) program or because they are in related groups defined by income and family structure. (Current Medicaid beneficiaries who are eligible because they are aged, blind or disabled are not included in Rite Care.)
- Uninsured pregnant women and uninsured children up to age 6, in households with incomes below 250% of the federal poverty level (FPL).

Care will be provided through five managed care plans selected through a process of competitive proposals, with recipients choosing a plan at time of enrollment. The program is administered by the Department of Human Services, which is the state's designated Medicaid agency, the Department of Health, and a management contractor with managed care experience.

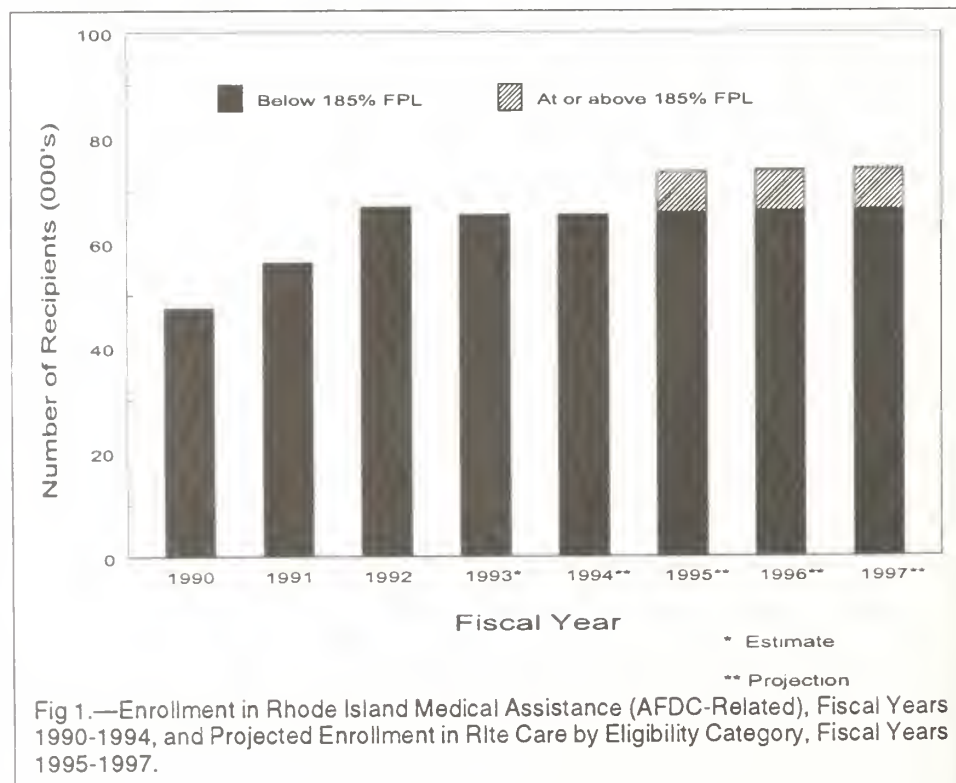
Enrollment in the Rite Care program is expected to approach 75,000 residents annually when fully operational (Figure 1). Of these, 65,000 are persons who would have been eligible for the traditional Medicaid program as AFDC or AFDC-related recipients (identified as "below 185% of FPL" in Figure 1). This group has been expanding in recent years in Rhode Island because of demographic and economic factors, increasing from just over 47,000 recipients in state fiscal year 1990 (July 1, 1989–June 30, 1990) to more than 65,000 in fiscal year 1993. Projections are that this group will stabilize at about 65,000 recipients. Additional recipients not meeting the previous Medicaid eligibility requirements are antici-

ipated to total nearly 10,000 recipients per year (identified as "at or above 185% of FPL" in Figure 1). Inclusion of the latter group expands state-provided health care coverage to include all pregnant women and children up to age 6 who live in households with incomes under 250% of FPL and who otherwise have no health insurance.

In fiscal year 1992, Medicaid recipients eligible through the AFDC program and related programs consisted primarily of women of childbearing age and children, as would be expected (Figure 2). Over one-third of recipients were children under age 6, and another 30% were women of childbearing age. These two groups will be augmented by the inclusion of additional eligibles under the Rite Care program. About a quarter of AFDC-related recipients were dependent children ages 6 and older, and a small percentage were adults other than

women of childbearing age.

Medicaid expenditures for this population during fiscal year 1992 averaged \$105.57 per month per enrolled recipient (Figure 3). Expenditures are estimated at \$109.81 in fiscal 1993 and \$118.59 in fiscal 1994. About half of all expenditures in 1992 were for inpatient hospital stays, and nearly a quarter were for care provided by hospital outpatient clinics and emergency departments (Figure 3). Physician care, provided in both inpatient and outpatient settings, was the next largest component, followed by drugs, including both prescription and over-the-counter products. Smaller monthly expenditures were made for non-physician mental health, dental, and optical care. As the managed care plans are expected to improve Rite Care recipients' access to primary care, as well as the continuity of care and the emphasis on preventive service-



Submitted by the Office of Health Statistics, Jay S. Buechner, PhD, Chief. Health by Numbers is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.

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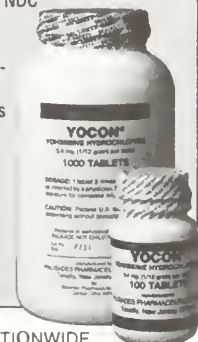
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.^{1,3,4} 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to 1/2 tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.³

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References:

1. A. Morales et al., New England Journal of Medicine: 1221, November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

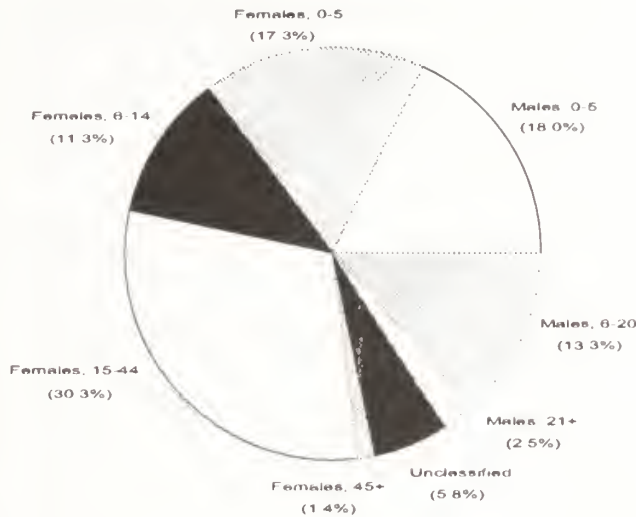
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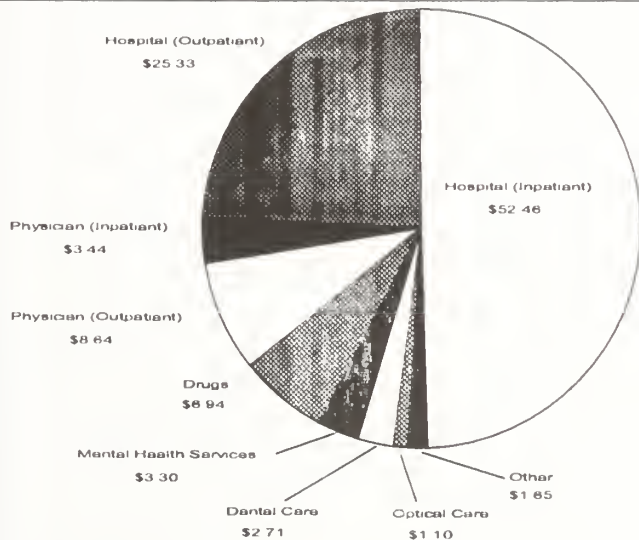
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Fig 2.—Enrollment in Rhode Island Medical Assistance (AFDC-Related) by Sex and Age, Fiscal Year 1992



Total Expenditure per Recipient: \$105.57

Fig 3.—Average Monthly Expenditures per Recipient for Rhode Island Medical Assistance (AFDC-Related) by Type of Service, Fiscal Year 1992

es in many instances, reduction in the use of hospital emergency departments for non-emergency care and in the need for inpatient care for preventable conditions is expected. These changes should reduce the expenditures in those areas over time, and, more importantly, improve the health of the RIte Care population.

The RIte Care program is a state effort to improve the health and the coverage for health care costs of low-income residents, enacted by the General Assembly at the Governor's initiative. It is also a research program, authorized by a 5-year federal waiver of Medicaid rules to accommodate the innovative aspects of the program. Viewed in both regards, the program will need ongoing monitoring to track patterns of enrollment and of medical care services and expenditures in order to evaluate both the health and fiscal benefits of health care reform in Rhode Island.

Source: Profile of Eligible Population Demographics and Health Service Utilization, RIte Care Program, July 1993.

THE RHODE ISLAND MEDICAL JOURNAL

The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

VOLUME I
NUMBER I

PROVIDENCE, R. I., JANUARY, 1917

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (September 1904)

The lead editorial discusses the diagnostic value of tuberculin and considers the risk that the use of tuberculin may lead to visceral dissemination of an erstwhile focal tuberculous lesion. "The ordinary methods of diagnosis of pulmonary tuberculosis in its earliest stages are notoriously uncertain and any aid to the early diagnosis will simplify more than anything else the battle against this scourge." The editorial urges the intelligent clinical use of tuberculin and that all valid measures be undertaken to detect the disease at its earliest stages.

A second editorial, in the form of a letter to the editor, announces the merger of two organizations to form a Society for the Study of Alcohol, an organization composed of physicians interested in the study and treatment of inebriety and the physiological nature and action of alcohol and narcotics in health and disease.

James L. Wheaton, Jr, MD, writes on colica mucosa and its treatment. The pathophysiology and etiology of this disorder—also called colitis pseudomembranacea or intestinal catarrh—is disputed. One group regards it to be primarily an inflammatory disorder of the lower bowel, with excretion of mucus as a consequence of the process; a second group states: "However well established the fact may be that the formation of the membrane occurs in the course of certain varieties of Enteritis, it is also true beyond cavil that this formation of membrane is dependent upon some nervous affection. Almost all the sufferers of this disease" . . . were at the same time hysterical, and all medication directed towards improving the catarrh of the bowel remained without effect." Ultimately, some observers believe that this disorder is the result of some neuroarthritic diatheses, which leads to intestinal atony and prolonged constipa-

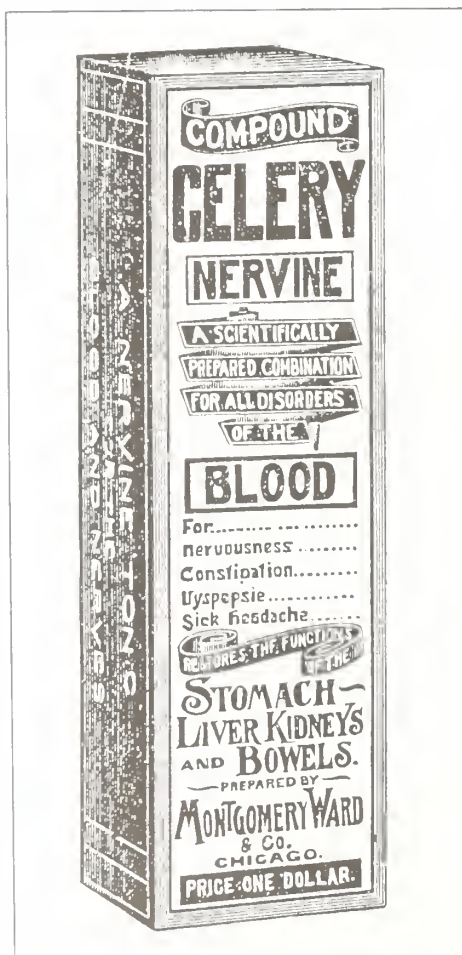
tion." Attention should also be directed, according to the author, toward the manifestly nervous nature of the disease, including, hysterical stigmata, convulsions, aphasia, neurasthenia, vertigo, peripheral neuropathies, hypochondriasis and melancholia. The author concludes: "The general nervous state of the patient calls for particular attention if for no other reason than that a continuance of the nervous disturbances exercises a deleterious effect on the function of the bowels, and derangement of the bowel-action can precipitate a new attack of Colica Mucosa. Appropriate treatment of the nervous system should be combined

with the dietetic treatment or should follow it—it should not precede it."

The early diagnosis of a case of tabes dorsalis is reported by John E. Donley, MD. Based upon a more exact concept of central nervous system anatomy and neurophysiology, earlier diagnoses of serious nervous disease, the author contends, are now possible. He summarizes the case of a 38-year-old male complaining of paroxysmal attacks of gastric pain and shooting pains in his legs. His pupils were equal, reacted to accommodation but not to light (Argyll-Robertson pupils); and both knee jerks were brisk and exaggerated. He contends that these finds "constitute a picture of tabes not easily mistaken." There follows a meticulous discussion of many of these clinical elements including the differential diagnosis of lancinating abdominal and limb pains, analgesia and the clinical distinctions between tabes, on the one hand, and similar disorders such as syringomyelia, combined sclerosis and peripheral neuritis.

50 Years Ago (September 1944)

The lead contribution is a paper on virus infections by Paul C. Cook, MD. The author first provides a brief outline of the biological characteristics of viruses and their distinction from bacteria. He then discusses, in somewhat greater depth, poliomyelitis, herpes labialis, influenza and the as-yet unisolated virus that causes the syndrome of post-encephalitic parkinsonism. He makes the following observation: "What the future has in store for us in the way of new virus infections is something no one knows. There are many viruses around us, living in harmony with their animal hosts, and doubtless some of them will in the future invade us, and either adapt themselves to their new habitat and establish new diseases, or fail to adapt fully enough to maintain their foothold and so die



out." Finally, he quotes Burnett: "Few things might have greater consequence to humanity than the evolution of a new virus with the spreading power of influenza and the virulence of old type smallpox."

Walter C. Alvarez, MD, discusses sick headaches, emphasizing the peculiar temperament of migrainous patients. He concludes: "Migraine is an entity—a hereditary peculiarity of the brain and the temperament. Hence it is useless to search through the body for the "cause." "The best way in which to avoid migraine is to live quietly and peacefully and sanely. To relieve attacks the best drug is ergotamine tartrate or gynergen."

Captain Edward Damarjian, MC, describes the uses of anesthesia in the tropics, based upon his experiences in 1028 surgical cases requiring anesthetic intervention in a hospital unit treating Chinese military personnel situated in the China-Burma-India Theater of Operations.

Editorials consider medical care insurance, the nature of the newly expanded *Rhode Island Medical Journal*, the physical fitness year, and a summary of the health care proposals in the Republican and Democratic Party platforms.

25 Years Ago (September 1969)

Dr Patrick S. Burne, speaking before the joint meeting of the Vermont and New Hampshire Medical Societies, discusses the international aspects of medical education, particularly as it is practiced in England today. His essay touches upon the problems entailed in an equitable distribution of medical care, the role of the basic sciences and the element of research in the training of the modern physician and the need for younger physicians to consider their role in the medical care rendered in resurgent, developing nations. He emphasizes the critical importance of training the medical student for general practice.

K.K. Hedge, MB, BS, writes on the magnitude and presentation of thyroid crisis in an Ohio hospital. In four of the five patients in thyroid crisis, he notes, there had been no previous diagnosis of Grave's disease. Two of the five patients were under 20.

Emergency medical services in Rhode Island are discussed by Joseph S. Karas, MD. A series of 15 detailed recommendations are submitted to the readership, each with a rigorously developed basis underpinning such suggestions. They include the recommendation that the Department of Health establish a division of emergency medicine to coordinate a state-wide system.

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To expedite production and ensure accuracy, authors are **strongly encouraged** to submit articles as well as computer-generated tables and figures on floppy diskette, formatted in any major MS-DOS or Windows word processor (eg, Microsoft Word, Wordperfect, Wordstar, Xywrite, Multimate, etc.) Macintosh disks will be accepted provided text is saved in an ASCII file. If possible, Macintosh disks should be saved in DOS format, using Apple File Exchange. Diskettes must be accompanied with at least one printed copy of the manuscript. Diskettes will be returned upon request.

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Journal Article:

1. Feinfeld DA, al-Achkar G, Lipner HI, Chirayil SJ, Hakim J, Avram MM. Syndrome of inappropriate secretion of antidiuretic hormone: Association with cavernous sinus thrombosis. *JAMA*. 1978;240:856-857.

Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

Book Chapter

3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases*, 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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Identification of Patients - Names and initials should not be used. When discussing individual patients use numbers (ie, Patient 1, Patient 2, etc.).

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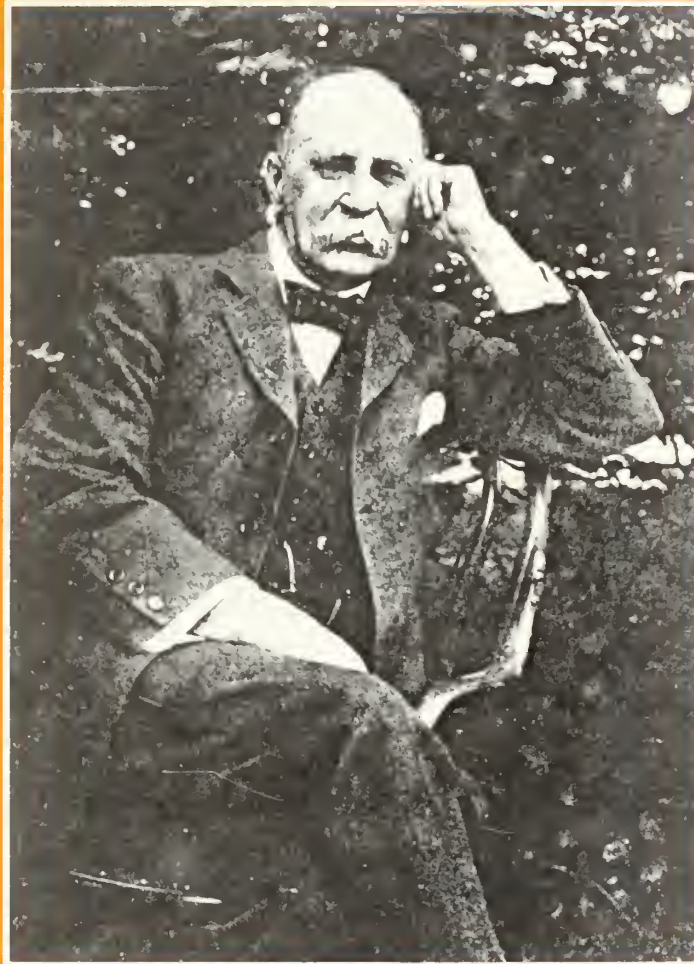
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Cover: Portrait of William Osler, MD (1849-1919)

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The Role of the Role Model

Role models are essential to the development of the complete and well-rounded physician. Much has been written about the influence of the "Chief" and the "Attending," among others, on the intellectual and emotional growth of the medical student and resident. I recall the "chief" during my residency having a status only slightly below God. His tall, distinguished appearance and mound of white hair did not detract from his image. There is no doubt that his personality influenced a generation of residents to become better physicians than they might have been otherwise. Perhaps my viewpoint from "the bottom of the ladder" and the mellowing effect of time have altered perceptions, but not the ultimate result.

Role models need not be alive or even of our generation. Cushing's Pulitzer prize-winning biography of William Osler¹ has had a life-long influence. Osler's single-minded dedication and industry present a model one might wish to emulate. He was one of those rare persons who seem to "have it all." Medical accomplishments resulted from a combination of brilliance and an amazing capacity for work. Serenity and "Aequanimitas," attributes elusive to many of us, seemed to have come naturally to this unusual physician.

In 1833, William Beaumont published the first original physiological observations in humans in America. The biography of Beaumont by Myer² reveals yet another unusual physician. Beaumont learned medicine by apprenticeship. (He never went to medical school.) An astute and meticulous observer of nature, he recorded in his journals various phenomena ranging from the wonders of Niagara Falls to the horrors of the War of 1812.

The extension of Beaumont's powers of observation to his unexpected patient (Alexis St. Martin) with a gastric fistula thus fits his lifelong pattern. How many of us

could take advantage of a similar situation or even recognize it? Beaumont is a true medical hero.

There is a danger in role models, however, be they alive or long dead. The danger lies in our inability to adequately fulfill our expectations. Who can be an Osler and single-handedly produce a textbook of medicine? Who can be a Beaumont and from a single patient realize new and significant advances in physiology? While there is no harm done that we cannot emulate these great men, there may be great harm in thinking that we should.

Physicians are faced with the impossible task of learning a continuously expanding body of knowledge. The most appropriate and constructive adaptation to this frustrating problem includes realizing that the task is impossible and accepting our human limitations coupled with a continuous effort to do the best job possible. Twerski³ described three maladaptive methods of coping with this impossible task:

1. The physician may be convinced that that he or she indeed knows all there is to be known. Such a feeling of omniscience is comforting but misleading. This attitude is not constructive since it impairs the ability to learn and accept new ideas. Doctors with this adjustment to reality are quickly left behind by the relentless progression of science.
2. Physicians may blame outside influences for their shortcomings. How often do we blame the patient for lack of compliance, the disease for being inevitable in its course, the family for failing in its obligations, the hospital staff for being inadequate? Such feelings, like those of omniscience, are comforting since they relieve the physician of responsibility. They are not constructive, however, because they provide little motivation for self-improvement.
3. Finally, physicians are trained to expect immediate gratification. Decisions often are made in life-threatening situations.

The expectation of immediate reaction in response to instructions is inherent to physician training. By making decisions quickly and expecting instant satisfaction one need not face the inevitable uncertainties of all human endeavor. Such behavior may be appropriate in certain limited situations. When extended to the entire practice of medicine, however, this attitude reduces the likelihood of careful analysis and prudent judgment.

When these three qualities, among others, are extended to life outside medicine they become enemies of intimacy, enduring relationships and the achievement of serenity. It is no coincidence that these factors often are seen in persons (including doctors) who resort to drugs and alcohol to cope with the personal and professional frustrations of life.

It is interesting that the great figures after whom we may wish to model our lives have successfully avoided these traps. Osler, perhaps as omniscient in his day as anyone, always received new ideas eagerly as evidenced by the frequent revisions of his textbook. Beaumont's experiments were carried out in the wilderness of early 19th century Michigan and Wisconsin. Nowhere does he complain that he was not afforded better facilities.

Both Beaumont and Osler were patient and pursued projects to completion, not expecting immediate results. Beaumont's experiments on an intermittently recalcitrant St. Martin were carried out over many years though attempts to lure St. Martin out of Canada for further studies after 1833 were unsuccessful.

I suspect that these and other great men and women of present and past acquired their talents in part without deliberate study or analysis. Their achievements, though, were certainly aided by education and hard work. This is not dissimilar to great artists and musicians. What, then, is the lesson to be learned from "role models"?

First, we should realize that we cannot expect to recreate the achievements or personalities of these persons. When Osler tells us of the importance of *aequanimitas* he does not tell us why each of us, individually, may not be able to achieve it or how to cope with the failure to achieve it. If one reads Osler and fails to acquire the ideal serenity he appears to have had, a feeling of failure may result. To expect to achieve such a state by reading how someone else, even one as great as Osler, did it is not realistic. Unrealistic expectations lead inevitably to failure and frustration.

Second, we should realize that we can extract from each of our role models qualities and ideals that are appropriate to each of us as individuals. It is important to consider the role of factors such as omniscience, projection and instant gratification, among others, in the lives of our role models and in our lives. We must analyze and dissect the elements of our mentors' success so that we can select only those qualities that may be realistically beneficial and leave the rest.

It would be naïve and simplistic to think that the influences of our seniors could be sufficient to remedy the inadequacies and uncertainties in each of us, but they may play an important role. I commend to you the lives of exemplary physicians whom you may know or to the biographies of those past. Do not try to emulate but rather analyze, be selective and attempt to incorporate into your life only those parts that seem desirable and achievable.

Herbert Rakatansky, MD

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Sir William Osler: A Second Opinion

William Osler, who lived from 1849 to 1919, is a deeply revered physician and writer, respected and admired for his wisdom, his clinical insights and his dedicated commitment to the most noble elements of ethical medicine. His great textbook has instructed generations of practicing physicians, and has reached a canonic status rarely achieved by other texts in recent centuries. For many decades, Osler's essays, condensed into a widely distributed volume called *Aequanimitas*, were given as gifts to each graduate of an American or Canadian medical

school. Truly, no Western practitioner of medicine has been accorded such near-universal admiration and respect, often becoming—in the words of Rakatansky (see preceding commentary)—an enduring role model for the earnest physician.

But Osler's world, a century ago, was a far different place. Were he alive today, Osler would be utterly astonished by the many changes in the art and practice of his cherished profession. First, he would be amazed by the gratifying advances in rendering diagnoses and in achieving effective therapies for human disease; and second, he would be dumbfounded by the assertiveness and increased educational attainments of the patients seeking aid. These two factors have dramatically altered the spirit and covenant defining the practice of medicine by providing, first, more compelling therapeutic choices, and second, by encouraging more vocal demands by the informed patient for a significant voice in the choice of therapies. No longer is the physician compelled to be the isolated observer as disease pursues its natural destiny; no longer does the patient tolerate being treated as some ignorant child, helped by a benevolent but impassive authority.

Were Osler alive today, he might renounce, or at least qualify, his oft-quoted instruction on the proper demeanor of the ethical physician:

In the first place, in the physician or surgeon no quality takes rank with imperturbability. Imperturbability means coolness and presence of mind under all circumstances, calmness amid storm, clearness of judgment in moments of grave peril, immobility, impassiveness, or, to use an old and expressive word, phlegm. . . . our equanimity is chiefly exercised in enabling us to bear with composure the misfortunes of our neighbors.

Were Osler alive today he would decry the aloofness and sense of separateness that he had once advocated when he gave his valedictory address to the University of Pennsylvania medical graduates in 1889. Instead, he might admit readily that the chemical dependencies and the behavioral problems that burden the general public can just as readily befall the busy practitioner—and that denial, aloofness or even equanimity are inept ways of confronting such problems, whether in their patients or in themselves. In 1889, he prayed that his audience might reap the special blessing of quietness, “. . . within this life, though lifted o'er its strife.” Today, he might be bemused by the naïveté of seeking for some implausible station over, rather than within, life's struggles. Furthermore, he might perceive that

seamless aloofness conveys the bizarre message that physicians are utterly immune to the conventional failings, contradictions and thirsts that plague common humanity.

In a quiet corner of his essay, Osler says: “. . . from our desolation only does the better life begin.” Today, he might be more explicit and say: “Only as we associate ourselves with the ills and limitations of humankind, dare we be permitted to attain that insight needed for effective treatment of our patients—or ourselves.”

The impassive, imperturbable physician is apt to be equally aloof to his own personal problems and vulnerabilities. This issue of *RHODE ISLAND MEDICINE* declares that a physician with, for example, chemical dependency, is too precious a resource to ignore or discard—particularly so since the majority so burdened, with supervised therapy, can be fully restored as competent and effective practitioners.

Osler, cofounder of the Johns Hopkins School of Medicine and Regius Professor of Medicine at Oxford University—were he alive today—would readily declare that there is still some limited value to aloofness; but he would place an even greater value upon honesty and that humanness of spirit that perceives no hierarchical wall separating the physician and the patient. He would urge engagement in the inevitable problems of living; and he would remind us of the words of another great practitioner: “Physician, heal thyself.”

Stanley M. Aronson, MD

Public Health Crisis Looms Unless Liability Laws Change

Replacement parts for the human body are routine components in treating cardiovascular, neurologic and joint diseases. Nearly 15 million Americans wear cardiac valves, pacemakers, defibrillators, vascular grafts, hydrocephalus shunts, intraocular lenses, artificial hip or knee joints, and dental implants. Each year, 2 million patients join their ranks. Among the elderly, more than a million cataract implants restore sight after the removal of opacified lenses. Each year also, 75,000 hydrocephalus shunt implants or revisions are performed in children suffering from relentless fluid accumulation in their skulls. As things stand, half of the current US population is likely to need an implant in their lifetimes.

So it may come as a surprise that 18 to 36 months from now, implants of prosthetic and life-enhancing devices may come to a

halt. The reason, quite simply, is that in our current litigious environment, companies that supply the medical device industry with the raw materials and components needed for manufacturing chronic implants now say they are no longer prepared to do so. The major US suppliers of "commodity plastics" have recently announced that they will limit, and eventually cease altogether, their shipments to medical device manufacturers. European and Japanese suppliers will not offer their materials for distribution in the United States. The reason is the same for all: The risk of liability is too high compared to the size of the market.

How can this be? Under current US product liability laws, any remote supplier of commodity materials can be joined in lawsuits involving medical products that are alleged to have failed, not lived up to expectations, or caused complications. Few people appreciate that most of the materials used in clinical implants are standard polymers or metals produced for other commercial applications, and later qualified by device manufacturers for use in medical devices. The amount of such substances needed for organ replacement parts is minuscule, despite the number of devices produced. The sales of materials to the device industry are almost inconsequential, but the cost of defending against lawsuits runs into the millions of dollars.

In America, disappointment with the results of medical devices for whatever reason often results in lawsuits against any company even remotely connected with the product. The trend is to sue the suppliers of the raw materials incorporated into chronic implants. Almost universally, courts have found that suppliers should be exonerated because they do not control what is made from their materials. However, the cases still have to be defended, at a cost that far exceeds any potential profit—not to mention the negative impact of media coverage that accompanies such controversies. The consequence: a rational business decision by suppliers to limit, and eventually to cease, shipments of materials to medical device manufacturers. The outcome: a threatening public health problem as thousands of Americans are denied access to critical, often life-saving or life-enhancing, products for which there are no substitutes.

No one is likely to step up to fill this market void. The small volume of material needed for medical implants cannot support separate plants, separate processes and separate material specifications to meet the specific requirements of medical devices. In any case, the cost of making small batches of materials would be prohibitive. Potentially better materials might be developed

through research, but they will still face the same liability risks that exist today. As a result, innovation is coming to a standstill. Patients are going to be affected by this shortage of materials in as little as 18 months, for example, when the supply of Dacron® for vascular grafts runs out. The embargo will lead to other shortages in 2 to 3 years. Some patients may die. Others will suffer unnecessarily or will see their quality of life reduced. Health care costs will go up when less effective technology is reintroduced to treat these patients.

As expressed at a recent hearing before the Senate Committee on Governmental Affairs, conducted by Sen. Joseph Lieberman (D-CT), the problem we face is societal in nature, and not amenable to a technical solution.

Measures must be taken to persuade remote suppliers of commodity materials or components for medical devices to keep them available to the US medical device industry. This will require a narrowly defined change in tort law to provide relief or remedy for ultimate liability claims against providers of standard, off-the-shelf elements of FDA-approved devices. US device manufacturers are prepared to assume full responsibility for their products, and thus liability should not extend beyond them.

Pierre M. Galletti, MD, PhD

The Deadly Nightshades

Nietsche may have invented the concept of superman, but it was a uniquely American culture that gave it dimension, élan and mass appeal. The enduring fame of Superman, now entering its seventh decade, has obscured still other comic book heroes equally capable of awesome exploits. One of these, for example, was Mandrake the Magician whose weekly adventures tempered, for a generation of adolescents, the harsh realities of the great depression years. Why the creator of the comic strip had chosen the name Mandrake is obscure, but certainly this name carries magical credentials extending back to ancient Greece where a local plant of allegedly great magical powers bore the name of *Mandragos*. By the middle ages, this name had been corrupted, in Old German, to *mandrahg*, and, eventually in English, to mandrake.

Mandragos, a biennial or perennial plant native to the Mediterranean basin, is a short, undistinguished shrub with fetid, fleshy, lanceolate leaves and clusters of shiny berries, somewhat resembling pars-

nip. It possesses a characteristically forked root that, with some febrile imagination, bears a vague resemblance to the human form (see figure). Plants do not carry warning labels and eventually some empiric testing of mandragos root likely elicited unforeseen effects, including narcosis, madness and even death. These outcomes—and the bifurcated root structure—led to the curious aura of mystery and occult evil that still surrounds this plant. It was believed, for example, that there was a homunculus hidden within the mandrake roots that shrieked hideously if the roots were exposed. Accordingly, many medieval herbal texts recommended that dogs be trained to dig up the plant lest the unearthly cries bennumb or madden the humans harvesting the roots.

The alleged medicinal benefits of mandrake have been marvelously diverse. It had served, reputedly, as an emetic, an anodyne, a drug central to primitive tribal initiation and fertility rites; and, in classical times, as a soporific said to be given to prisoners awaiting crucifixion.

Shakespeare has Cleopatra say: "Give me to drink mandragora, That I might sleep out this great gap of time, My Anthony is away." And Othello places mandragora and the poppy amongst "... the drowsie syrups of the world." Chapman, a contemporary of Shakespeare states: "I have drunk Lethe and mandragora to forget you." (Lethe is the river of forgetfulness and oblivion in classical Hades, and is the etymological source for the word lethargy.) Donne, with great pharmacokinetic prescience, describes the perilously narrow range between the therapeutic and lethal concentrations of mandrake extract, when he writes: "... mingled wine with mandrake, whose oper-



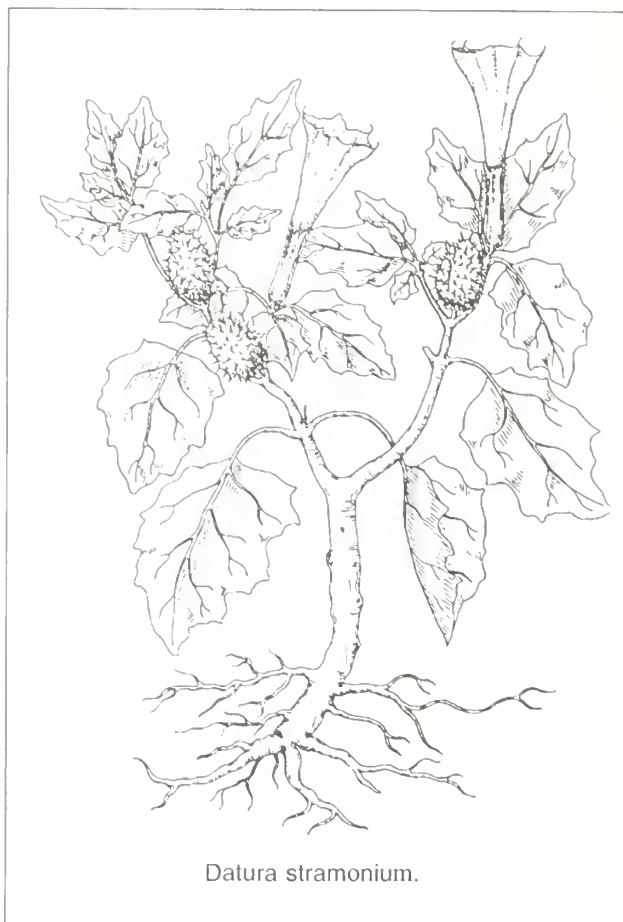
Mandragora officinarum.

ation is betwixt sleepe and poyson." Mandrake appears briefly in the Bible as a possible fertility aid within the complex tale of Jacob, Leah and Rachel (Genesis 30:14).

The mandrake plant (Linnaeus named it *Mandragora officinarum*, ie, the mandrake of the apothecaries) is a member of an astonishingly eclectic botanical family called the *Solanaceae* (the sun flowers). This diverse family includes *Solanum tuberosum* (the Irish potato); *Lycopersicon esculentum* (the common tomato); the *Capsicum* genera (the New World peppers such as chili, cayenne, pimento); and *S. melongena* (the common eggplant). John Parkinson, the English botanist, was morbidly suspicious of eggplant. In 1640 he wrote: "... for by their bitterness they engender Melancholly, the Leprosie, Cancers, the Piles, Impostumes, the Headache and a stinking breath ... unless they be boiled in Vinegar. It invites to Venery." Verily, Parkinson seems to have discovered the alchemic substrate of most of man's ills; and many chefs will be amazed to learn that the principal ingredient of their ratatouille had once been considered an aphrodisiac. The pre-Linnaean name for eggplant, incidentally, was *Mala insana*, the mad apple. Still other members of the solanaceous family include *Nicotiana tabacum* (the source of smoking tobacco); and the delicate and wondrously colorful petunias.

Many of these plants have emerged historically in curious ways. In 1676, a contingent of British soldiers was assigned to the Jamestown, Virginia, garrison. Some of them harvested a local weed, then called Jamestown Weed or thorny apple, for an impromptu salad. Within hours, those who ate it exhibited a manic, disruptive and foolish behavior lasting for many days after which they "... return'd to themselves again, not remembering anything that had pass'd." The name, Jamestown Weed, has gradually been contracted to its current secular form, Jimson Weed (*Datura stramonium*). The weed is widely distributed throughout North America and its behavior-modifying and poisonous essence had been recognized, and respected, long before the British entered the New World. *Datura* plants were employed for sacred rites in the Aztec culture and to this day they are surreptitiously cultivated by Native American tribes in the southwestern states. *Datura* species are resident to Asia as well; indeed, the word *Datura* is a Hindi

word (*dhatūra*) meaning thorn-apple. The symptoms of *datura* intoxication include headache, nausea and vomiting, vertigo, thirst, dilated pupils, hallucinations, mania;



Datura stramonium.

and ultimately, amaurosis, convulsions and death.

Yet another member of this potentially hazardous plant family is Henbane (*Hyoscyamus niger*) sometimes called Old World nightshade. A bane, in old English, describes a poisonous substance (eg, wolfbane, cowbane, etc.).

The most pharmacologically prominent of the berry-bearing solanaceous plants is *Atropa belladonna*, commonly called deadly nightshade or sorcerer's herb. It is the likely agent, when added to wine, for the frenzied behavior of the ancient Bacchanalian rites. The genus name, *Atropa*, is an allusion to Atropos, the third of the three Grecian Fates, goddesses held responsible for determining the destiny and life-span of each mortal. (Clothos, the first Fate is said to spin the thread of life; Lachesis, the second, determines the length of thread assigned to each mortal; and Atropos, the third, has the cheerless task of cutting the thread of life. Atropos, in Greek, means incapable of turning, ie, remorselessly inflexible and it was considered an appropriate name for the toxic essence of this plant, whose effects could not

be reversed. In the 19th century, the name evolved to atropine.) *A. belladonna* remains the principal source of such currently used drugs as atropine, scopolamine and hyoscine.

No temperate or tropical culture, developing or advanced, is ignorant of the pharmacological properties of the solanaceous plants. Aboriginal tribes of Australia, for example, use a local plant called *pituri* (*Duboisia hopwoodii*) for its narcotic properties. When, during World War II, the Australians were cut off from commercial sources of atropine and scopolamine, they turned to their native *Duboisia* for the hyoscyamine alkaloids.

The members of these closely related solanaceous genera (*Datura*, *Hyoscyamus*, *Atropa*, *Mandragora*, *Duboisia*) all contain varying proportions of powerful sympatholytic (muscarinic) alkaloids particularly atropine (DL-hyoscyamine) and scopolamine (L-hyoscine). These naturally occurring agents may be converted synthetically to methyl nitrates or methyl bromides to form quaternary analogs such as homatropine and propantheline (Pro-Banthine). Even the benevolent potato contains small amounts of a toxic alkaloid, solanine, which is readily destroyed in cooking.

The pre-Columbian Europeans were quite familiar with the toxic effects within the *Datura*, *Mandragora* and *Atropa* genera. And when a new, but botanically related, plant—the tomato—was brought back from the New World, the initial reaction that it was poisonous is quite understandable.

Few botanical families can boast of the astonishingly varied products generated by the *Solanaceae*. This essentially New World group of wild perennials is an abundant source of nutrition (potatoes, tomatoes, eggplant), dietary enlivenment (chili and other peppers), beauty (petunias), morbid diversion (tobacco), and medication (atropine, scopolamine); Perhaps not magical, but truly astonishing nevertheless in the complexity of its gifts to mankind.

It is a truism that when the molecular formulas of hitherto enigmatic extracts are clarified, their former mysticism is irrevocably lost. Circe, the mythic Greek enchantress, used a decoction of mandragora when beguiling the sailors of Ulysses. The Homeric glamour dissipates when the alleged potion is now known to be but a weak solution of scopolamine and mandramine. Stanley M. Aronson, MD

The Physician's Health Committee of the Rhode Island Medical Society

Herbert Rakatansky, MD, and William Moclair, RN

The Rhode Island Medical Society recognizes that it is the responsibility of the profession to ensure that the practice of medicine is conducted according to the highest ethical and scientific standards. Accordingly the Rhode Island Medical Society has established three committees to monitor these areas. The Mediation Committee considers issues of ethical behavior. The Competence Committee considers the scientific validity of practice. The Physician Health Committee considers all issues of physician health and well being.

We believe that illness may impair a physician's ability to practice and that it is our responsibility to seek out and help such colleagues. We also have a responsibility to the public. If a physician is impaired in his/her practice and unwilling to accept treatment, or the treatment is unsuccessful, we take steps to insure that he/she does not practice. The Health Committee does not consider questions of ethical behavior or competence unrelated to illness. The committee treats physicians, osteopathic physicians, dentists and podiatrists, each of which are represented on the committee.

Alcohol and other drug abuse was the original emphasis of the committee, but the treatment model has been applied subsequently to other diseases as well.

The committee accepts referrals from any source: patients, colleagues, family, and others, but we do not consider anonymous referrals. However, we do guarantee anonymity to the individual reporting. This is important since there is often a "power relationship" (nurse or resident reporting an attending physician).

Once the referral has been made a team from the committee meets with the physician. This team consists of the director of the program (currently William Moclair, RN) and one or two members of the com-

mittee. At the meeting the issue of alleged illness is discussed.

If the physician admits that there is a problem (in this example substance abuse) we ask him/her to suspend practice immediately and enter treatment, usually within 24 hours. If the physician has problems with patient coverage the committee is able to request help from colleagues. The initial treatment modality and location is determined by the committee in consultation with the physician's insurance company. Such discussions have been amicable and the third parties have cooperated, realizing that initial effective treatment is desirable.

If the physician denies that there is a problem and there is no evidence that his/her practice is impaired the committee requests an evaluation by independent authorities. This includes evaluation by an internist, a neurologist and a psychiatrist specializing in addiction. Following the evaluation another meeting is held with the physician and he/she is given the results. If there is evidence of illness, treatment is prescribed based on the recommendations of the consultants.

Doctors virtually never refuse to meet with the committee. Often the doctor has been referred by an institution and has agreed in advance to meet. If the doctor is reluctant we emphasize that he or she may be in trouble and offer to serve as an advocate.

More troublesome is the question of what to do if the doctor needs treatment and refuses. If the committee believes that there is an active problem of alcohol or substance abuse that might affect patient care we insist that treatment be started immediately and that no further patients be seen. If the doctor refuses, the committee informs the doctor that a report will be made to the Board of Medical Licensure and Discipline as well as to the institution that made the initial referral. This leverage almost always is sufficient motivation for cooperation. If the doctor continues to refuse, the board is contacted. This is rare, however.

Following the initial phase of treatment, which usually lasts 1 month, an aftercare contract is signed. The doctor agrees to be monitored by random, observed urine tests, initially twice weekly. Individual counsel-

We believe that illness may impair a physician's ability to practice and that it is our responsibility to seek out and help such colleagues.

ing or psychotherapy is prescribed (at least once weekly). Weekly meetings of doctors suffering from addiction are part of the treatment. At this time we have sufficient patients to sponsor two sessions each week. These are run by specialists in addiction and psychiatry or psychology.

Finally, self-help groups such as Alcoholics Anonymous or Narcotics Anonymous are an essential part of recovery. Attendance is specified in the contract. Initially the doctor has a meeting or counseling session every day. The contract is for 3 years and usually is renewed for another 2 years. The committee receives regular reports from the treating physicians and counselors. An advocate from the committee meets personally with the doctor regularly.

If the doctor relapses during the the contract term, treatment is intensified. Often another period of inpatient therapy is needed. In some cases prolonged intensive treatment for 3 to 6 months is prescribed.

A similar approach is used with other behavioral conditions such as depression, disruptive behavior, and so on. In these cases it is seldom readily apparent that the doctor's practice is impaired, and our leverage to insist upon treatment is diminished. Often the referring institution (if there is one) provides the motivation.

The role of the committee in the treatment of sexual misbehavior is changing. In the past this type of behavior has been dealt with through administrative or legal systems. We now realize that persons who exhibit this type of destructive behavior may have an underlying emotional disturbance, which, in some cases, may be amenable to treatment. Recently, resources for increasingly accurate diagnosis and treatment recommendations have become available. The expanding awareness and sensitivity of society to these problems have increased the number of referrals to the committee. The committee recognizes differences in the spectrum of this behavior.

One situation involves the doctor re-

ABBREVIATIONS USED

AA: Alcoholics Anonymous

HMO: Health maintenance organization

NA: Narcotics Anonymous

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ferred for verbal sexual misbehavior in the professional situation directed at persons other than patients. It is often very difficult to get the victims (usually women) of this kind of behavior to come forth since there is usually a power relationship involved (a senior physician talking about house staff or employees). In such cases a complete psychiatric evaluation is obtained along with other evaluations that seem indicated (medical, neurologic, etc.)

A different situation exists when the doctor is referred for inappropriate sexual behavior with a patient. This behavior may be verbal or may involve physical contact. In these cases a more extensive evaluation is required. A 5-day inpatient evaluation is obtained at a center specializing in evaluating professionals with sexual misbehavior. Specifically addressed are the questions of whether there is any danger to patients and whether, if the doctor is allowed to return to practice, there should be any restrictions or supervision.

In cases of alleged sexual misbehavior with a patient, the complaint of necessity must come from the patient. If the doctor refuses evaluation (so far no one has refused) or treatment the patient is informed of the right to pursue civil action, report the incident for possible criminal prosecution or file a complaint with the board. In each instance due process must be followed. Patients (usually women) often do not wish to expose themselves to the rigors of cross examination resulting from this legal process. Since the committee treats these matters as illnesses and bases its judgment on extensive medical and psychiatric examinations rather than on only the merits of the alleged incident, the victim is not subjected to the legal process.

Of course, no financial or legal penalty is imposed. If such a penalty is the motive of the patient then he or she must use the courts. The patient can be assured, however, based on the best available medical and psychiatric evidence that the doctor will receive necessary treatment and his practice will be restricted or suspended if necessary, and future patients will be protected.

In the first situation (no patient involvement) the committee makes recommendations to the doctor regarding medical and psychiatric therapy. The medical and/or psychiatric treatments are monitored by the committee for as long as indicated. If the doctor refuses evaluation or does not comply with the recommended treatment, the original referring institution (hospital, HMO, etc.) is notified. The institution must then deal with the situation administratively.

In the second situation (patient involvement) the doctor may be asked to restrict his practice or practice under supervision or monitoring. The medical and/or psychiatric treatment and the practice restrictions are monitored by the committee for as long as indicated. If the doctor refuses to comply with practice restrictions the Rhode Island Board of Medical Licensure and Discipline is notified. Testimony from the patient(s) would be required in this circumstance.

If the evaluation reveals a character disorder or a sociopathy thought not to be amenable to therapy and if the behavior is of the first type (not involving a patient) the matter is referred to the original referring institution. If the behavior involved a pa-

disease, leaving 54 (32%) requiring professional attention. Thus 79% of the encounters resulted in recommendations for treatment. In the other cases the committee performed a valuable function in protecting the doctor from the effects of observations that were not deemed to be accurate.

Of the total cases, 43 have been known to the Rhode Island Board of Medical Licensure and Discipline. Either the board referred the case to the committee, heard about the case independently or the case was referred to the board by the committee.

In 8 cases there was a question of sexual misbehavior. Five colleagues are under treatment currently. One has had his license revoked, 1 moved out of state, and in 1 the allegations were not verified.

In 1993 the committee was referred 15 new cases (6.5 cases/1000/year) including 2 dentists. Comparable figures for 1993 were 9.6/1000 in Maryland and 3.3/1000 in New Jersey. Four of the total did not have a confirmed problem. Five cases had substance abuse problems and currently are in treatment. Six cases had diagnosable behavioral problems. Four are being treated.

Currently the committee is involved in the active treatment of 28 patients (12 physicians/1000 practicing physicians) of whom 18 are on random urine drug testing. The comparable figure for Maryland is 16.3 physicians 1000.

Our budget is approximately \$35,000 annually. The funds are for the salary and benefits of our one employee (an RN with extensive background in substance abuse counseling and confrontation techniques) and education. Members of the committee receive no compensation and are not reimbursed for expenses, such as travel. The funds come from donations from each Rhode Island hospital and medical staff. Major support comes from the RI Joint Underwriting Association and the RI Medical Society Brokerage Co. The entire program costs less than one malpractice suit.

Poor medical care (which is very expensive) as well as true malpractice (and the resultant legal consequences) can be lessened by identifying and treating doctors who do not function optimally because of illness. The medical profession and the public are well served by this peer-surveillance.

Table 1.—Physician Health Committee Activities (1979–93)

Alleged Problem	Number	Requiring Treatment
		No., percent
Substance Abuse*	101	80 (79.2%)
Behavioral Problems**	70	54 (77.1%)
Totals	171	134 (78.4%)

* includes alcoholism.

** includes sexual misbehavior in a professional setting.

tient and the psychiatric opinion is that the doctor's practice should be restricted or suspended and the doctor refuses, the board will be notified. Again, testimony of the patient(s) will be required in this circumstance. We have yet to encounter such a case independent of a board referral.

Since 1979 the committee has confronted 171 persons of whom 165 were physicians. The others were dentists or podiatrists. Dentists are more difficult to identify since they practice in isolation and are less subject to peer review and direct observation of colleagues. This represents a rate of 5.5 physicians/1000/year. This compares to 3.3 physicians/1000/year doctors in Maryland and 3 physicians/1000/year in New Jersey (personal communication). Both of these states have well funded professionally run programs that serve as models for others. In Maryland (15,000 doctors) there are 5 full-time and 1 part-time employees (0.37 employees/1000 doctors) and in New Jersey (24,000 doctors) there are 4 full-time and one part-time employee (0.19 employees/1000 doctors. Rhode Island (2000 doctors) has one part-time employee (0.25 employees/1000 doctors).

Of the total cases encountered, 101 (59%) had an alleged problem of substance abuse (including alcohol). Upon evaluation, 21 had no demonstrable problem, leaving 80 requiring treatment. Of the 70 cases with alleged problems other than substance abuse (eg, depression, disruptive behavior, etc.) 16 were found not to have a diagnosable

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Treatment Outcome Studies on Physician Impairment: A Review of the Literature

John Femino, MD, and Ted D. Nirenberg, PhD

Emotional and behavioral disorders have been cited frequently as the most common health hazards affecting physicians. Studies on the types of problems that bring physicians to the attention of organized medicine and licensing/regulatory agencies consistently show that the most common problem is alcohol and drug dependence. Affective and personality disorders are also common.

During the last few decades, institutional and public attitude about substance abuse has shifted from compassion to concern. Collaborative relationships between regulatory agencies and organized medicine allow for the proper identification and treatment of physicians in need. Such efforts, however, would never have happened if there had not been an early appreciation that treatment was effective. The "Impaired Physician" movement is based upon a humane

intent to provide help for distressed colleagues. Early efforts were not based upon elaborate justification or research on treatment effectiveness, as the act of preventing one suicide or returning one doctor to practice was considered enough proof of success. However, there is now increased interest in carefully examining the effectiveness of identification and treatment.

Information on physician health issues can be collected from three major sources: physicians seeking professional treatment, licensing and regulatory agencies, and survey results from the general population. The authors apply their experience as treatment providers, managed care consultants and treatment outcome researchers to review critically the effectiveness of intervention and treatment efforts specific to physicians as patients.

Treatment Program Outcome Studies

Clinical studies were rare until the 1960s. Most were descriptive in nature and were derived from analyses of physician suicide and experience in psychiatric treatment programs. (Chemical dependency programs did not become readily available for another decade.) Alcoholism and drug abuse then were considered difficult problems to treat, with high recidivism rates and poor outcome, perhaps because physicians frequently presented to treatment late, after multiple psychosocial and professional failures. Our review focuses on 5 formal treatment outcome studies, which we address in chronological order.

Goby et al¹ reported on the follow-up of substance-abusing physicians treated at Lutheran General Hospital's chemical dependency unit. Among records of 10,000 patients reviewed, 51 were identified as physicians and were expressly studied. Most (84%) participated in a telephone interview (the remaining were either dead (14%) or incarcerated (2%)), on average 42 months (range 3–120 months) after release from treatment. Obstetrician-gynecologists and anesthesiologists were over-represented. Over 80% of the sample reported pretreat-

The majority (82%) of physicians' health programs are administered by state medical societies and have an informal and voluntary relationship with the licensing board.

ment problems in their job performance and family functioning, and 30% had previous professional treatment and/or self-help attendance. Despite these severity indicators of the 43 patients interviewed at follow-up, 44% reported complete abstinence, and 30% more reported infrequent and non-problematic use. Other health and family functioning indices suggested that over 80% reported significant improvement secondary to treatment. The authors concluded that despite the fact that 7 of 51 (14%) died and 6 of 43 (14%) required re-hospitalization, most physicians improved and that treatment was more effective than previously appreciated.

Kliner et al² reported a similar study of physicians treated at Hazelden between 1973 and 1976. Accounting for only 2% of the total admissions, physicians did not differ significantly from the general patient population except for greater use of narcotics and sedatives. The 85 physicians who completed treatment (no data reported on drop-outs) were sent a questionnaire regarding treatment outcome, with corroborative data obtained from questionnaires given to their "concerned persons." Of the 67 patients who were contacted, 76% reported complete abstinence, 16% reported light/moderate drinking, and 7% reported significant problematic relapse. In addition, 10 physicians had died. The authors found that the 1-year treatment abstinence rate for physicians (76%) was greater than the rate for the general population treated at Hazelden (61%). The authors, however, did not analyze the potential reasons for the differential outcome.

Johnson and Connelly³ reported on 50 doctors who were treated from 1974 to 1979 at the Menninger Hospital's 6-week addiction program. More than 60% of the physicians sought treatment secondary to external pressure. In particular, 24% had significant job-related problems (loss of

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ABBREVIATIONS USED

AA: Alcoholics Anonymous
DEA: Drug Enforcement Agency
DSM: Diagnostic & Statistical Manual

licensure or marginal practice). While a specialty comparison was not reported, more than half were primary care physicians. Almost three-quarters (72%) of the physicians had a family history of alcoholism. Over 60% were significantly depressed. Among the younger physicians, 50% showed borderline personality profiles, and among the older physicians, 60% showed evidence of organic brain impairment. The physicians were involved in a 2-year follow-up involving telephone contacts and periodic visits to the program. Successful outcome was determined by abstinence and effective job functioning, with brief relapses not considered as failures. While most physicians (64%) were found to be sober and practicing medicine, 20% continued to have problems and 16% were dead or lost to follow-up. Patients with psychosis or borderline personality disorder did less well, but there was no difference in outcome by drug of choice or degree of organicity. The authors noted that the common denominator of successful outcome was the extent that the physician could internalize his treatment experience.

Herrington et al⁴ reported on 40 health care professionals who were involved in the Impaired Physician Treatment Program at De Paul Rehabilitation Hospital during 1979-80. More than 60% of the physicians were referred to the 30-day inpatient program because of restriction of clinical privileges or legal actions, and more than 30% required formal reports of treatment compliance to be sent regularly to licensing and regulatory agencies. At the time of follow-up assessment, the patients were in various stages of their 2 year comprehensive recovery program, with 17% not completing the program, 25% with less than 1 year of participation, and 58% either completing or with greater than 1 year of participation. Of these patients 15% required extensive residential treatment after completion of the inpatient phase because of relapse or medical complications. Follow-up indicated that 77% of the total sample (94% of treatment completers) had returned to active medical practice, 67% had continuous sobriety, 15% had a brief relapse, and 17% had a problematic relapse resulting in treatment dropout. A natural pattern of relapse was noted, with problematic relapses occurring within the first 90 days, and brief relapses occurring during the later part of the first year of recovery. The authors identified a number of factors that seemed to correlate with a positive outcome, including a long (2-year minimum) duration of treatment, family involvement, self-help participation, ongoing

psychotherapy, physician specific group involvement, and urine monitoring.

Morse et al⁵ compared 73 physicians to 185 non-physician patients treated at the Mayo Clinic inpatient Alcoholism and Drug Dependence Unit from 1975 to 1978. The physicians were contacted at an average of 37 months (1-5 years) after treatment completion. Follow-up included telephone interview with the patient; with more than 85% confirmed by a significant other. Approximately 25% of both groups were excluded from the study because of incomplete treatment, death or failure to contact. Favorable outcome was defined as either total abstinence or a brief non-problematic relapse, and not favorable was defined as either continuing to drink problematically or controlled drinking. The physicians had higher favorable outcome (83%) than the non-physicians (62%), with only 8% of the physicians and 24% of the non-physicians continuing to drink problematically. Including those who dropped out, did not complete treatment, or died, 60% of the physician group and 47% of the nonphysician

. . . those physicians with successful recovery were those who became active AA participants, espoused a spiritual pathway, effectively dealt with compulsive behavior such as overwork, and improved interpersonal and family relationships.

group had favorable outcomes. Of the 20 drug-dependent physicians, 95% had a favorable outcome; of the 19 alcohol-dependent physicians 84% had a favorable outcome; and of the 14 polysubstance-dependent physicians, 64% had a favorable outcome. The poorer outcome of the polydrug category appeared to be related to the extent of psychopathology, but the authors were unable to determine if the psychopathology was preexisting or a consequence of the polydrug abuse. Among the physician group in terms of severity of problems, there was no difference in outcome between those who had a "mild" problem (first treatment and no professional consequences) and those who had a "severe" problem (multiple admissions and professional status restrictions). The authors noted that the better success of the physician group compared to the non-physician population was a result of the higher degree of coercion placed on the physicians, either informally based on practice partnership issues or formal monitoring systems involving a medical society

peer committee or licensing board.

These treatment program-based studies suggest that treatment was effective for physicians and that physicians did better than others of similar background. They noted changing patterns of chemical use, with alcohol as the primary drug in the older physicians and more polysubstance abuse and drug abuse among the younger physicians. The extent of psychopathology appeared to have some correlation with outcome, suggesting that those with early childhood trauma, a family history of alcoholism, and/or personality disorder do more poorly. Although severity indicators differed widely among these studies, those physicians with multiple problems were not necessarily destined to a poorer outcome. Although most of these studies did not detail the extent of involvement in formal monitoring programs at the time of follow-up, most suggested that this factor had a major effect on successful outcome. Relapses were fairly common, with several studies making distinctions between slips and major relapses resulting in significant functional impairment. The pattern of relapse suggests that those early relapsers are more physically dependent and resistant to treatment, and that "slips" were more common later in treatment and not necessarily problematic if associated with continued treatment efforts. Some studies confirmed the reliability of self-reports, and the correlation between substance use and functional status. Most treatment completers had significant improvement in the quality of their lives, and their professional competency. Although many of these studies were done after inpatient chemical dependence treatment, improved outcome appeared to be related to the intensity of treatment involvement over time, and motivational factors related to the extent of potential losses.

Medical Society Surveys and Outcome Data

By the mid-1980s, most states had developed impaired physician programs of some type. The organizational structure varied by state and has been influenced by legislative efforts. Most (82%) physician's health programs are administered by state medical societies and have an informal and voluntary relationship with the licensing board.⁶ Legislative efforts in 9 states have created 3 different organizational structures: programs administered by the state medical boards (California, Oregon), programs administered by independent agencies (Colorado, Montana, New Mexico, Washington), and programs administered by medical so-

cieties through contracts with medical boards (Alabama, Arizona, Florida). Programs that have been funded through legislation tend to have full-time staff, more sophisticated database structures, and access to follow-up information that approximates a more formal outcome study. Those medical society programs that are smaller and staffed by dedicated volunteers, have not had the resources to conduct outcome studies, and do not have as easy access to outcome data for those physicians who refuse to become involved or who drop out. We have chosen a few examples of differing organizational structures to illustrate potential sources of outcome data.

Reading⁷ reported on the 9-year experience of the New Jersey Physician Health Committee, a voluntary type organizational structure that encourages early identification and treatment (greater than 85% of their referrals were from colleagues, family or self-referral and very few were initiated by the State Board of Medical Examiners). There were 601 intakes from 1982 to 1990, about a third alcohol-related, a third drug-related, a quarter psychiatric-related, and the remainder related to dementia and physical problems. A survey of 308 physicians with a primary diagnosis of chemical dependence was performed in 1991. Excluded from the survey were those who had a serious dual diagnosis problem, or those who dropped out of treatment, died, or did not have a diagnosable problem. The study data included self reports of relapse, results of urine toxicology screens, and reports from family, employers or co-workers. Favorable outcome was measured by complete abstinence or one brief relapse. Almost all (98%) of the physicians reported favorable outcome at the 2-year follow-up and 86% reported favorable outcome after 9 years of follow-up.

Alpern et al⁸ reported on the outcome of 85% of the 92 physicians followed by the Maryland Physician Rehabilitation Program. Data were reported on 78 physicians with a mean recovery duration of 88 months who responded to a one time mailed survey. Outcome measures reflected the quality of recovery, and included an assessment of family and occupational functioning and a comparison of their quality of life prior to treatment and at the time of the survey. A majority (87%) reported excellent family functioning, and 89% were practicing medicine on a full-time basis. The rate of recovery for patients without psychiatric or physical illness was 86% for those with alcoholism and 90% for those with drug addiction. The recovery rate dropped to 75% for the

total sample when patients with psychiatric and physical illness were included. Self-assessment of quality of life indicated significant improvements after involvement with the program, despite 21% having significant consequences as a result of impairment including suspension or loss of medical license, loss of practice partnership, suspension of drivers license, and/or loss of hospital privileges.

Shore⁹ reported on the 8-year treatment outcome (1977 to 1985) of 63 impaired physicians on probation with the Oregon Board of Medical Examiners. Referral sources were mainly from hospitals, peers, pharmacists and law enforcement, with only a few from the Oregon Medical Association or self referral. Most referrals (78%) were for substance abuse problems, and 22% were for mental health problems. Physicians were rated as improved if they were engaged in their professional activities and

Clearly, these data support the clinical impression that treated physicians are no more (and perhaps less) of a risk to the public than other physicians, and that treatment improvements do in fact carry over into practice-related behaviors.

had stable professional and interpersonal relationships. After including deaths and drop-outs, the improvement rate was 73% for the entire sample, and 79% for those with alcohol abuse. Since urine toxicology monitoring was not mandatory during the early years of follow-up, an analysis was conducted to determine its impact. Those physicians who were urine monitored had a higher (96%) improvement rate than those who were not monitored (64%). While half (49%) of the addicted physicians had at least one documented relapse, there was no significant difference in long term outcome for those who stayed completely abstinent from those who had a relapse.

The largest and most extensive database on physician health issues comes from the experience of the Medical Association of Georgia. Since its initiation in 1975, more than 2500 physicians have been treated. It is noteworthy to realize that their experience is quite different from most medical societies. They act as a tertiary treatment center and accept referrals from throughout the country. Their programs specialize in chemical dependency treatment and typically are longer in duration, are residential and use

physician-specific treatment techniques.

The demographic and pre-treatment characteristics of the physicians treated in Georgia reflect their tertiary care status. For example, Gallegos and Norton¹⁰ reported on 675 physicians treated between 1974 and 1984. These physicians were older and more likely to be male than the general physician population. Among these physicians, more than 83% had severe marital discord, 70% had previous treatments for psychiatric or substance abuse problems, 33% had either lost their license or their license was in jeopardy, 24% had DEA license problems, and 26% had criminal or legal problems such as drunk driving or felony charges. Twice as many of these physicians (15%) were not practicing at the time of evaluation as compared to 7% of licensed physicians nationally. They noted that the specialty distribution did not change from year to year since its inception in 1974; with anesthesia and primary care physicians (family and general medicine) over-represented. Anesthesiologists had an apparent 7.4 times excess prevalence, were younger, were more likely to be in their residency training, and were more likely to abuse narcotics and have a parenteral route of administration. General practitioners were older, more likely to have a solo practice or practice in a rural area, abuse alcohol alone and have more severe physical sequelae of their addiction.

The treatment outcome of these physicians was more difficult to obtain because so many of their patients returned to their home state after treatment. A preliminary survey of 250 physicians who completed the 4-month treatment program and 2-year aftercare contract noted that nearly three-quarters reported complete abstinence.¹⁰

In a more complete analysis of outcome and relapse, 100 physicians who entered into a continuing care contract (Georgia residents only) and participated in treatment from 1982 to 1987 were studied.¹¹ Most (94%) of the physicians had completed all phases of the Georgia Impaired Physician Treatment Program. The physicians had an average age of 39 and 45% were married. Alcohol was the most abused drug, followed by cocaine, opiates, and benzodiazepines. Most (70%) of the physicians combined alcohol and drugs, and 46% reported parenteral drug use with only 12% reporting abuse of just one drug (usually alcohol alone). Half (49%) had license or criminal/legal problems and 58% had previous treatment. Over three quarters (77%) of the physicians successfully completed all aspects of their continuing care contracts

for 5 to 10 years after their initial treatment and reported complete abstinence. Twenty-two percent had relapses, with most receiving further treatment for chemical dependence. A comparison of abstainers and relapsers showed no difference in pretreatment or treatment variables, except that all of the relapsers stopped participating in their recovery program before relapse. The time course of relapse indicated that more than 68% of the relapses occurred within the first 2 years of treatment. Early relapsers were less likely to believe in the disease concept and were more likely to be in denial and to reject treatment recommendations. Family and emotional issues were frequent relapse triggers for those who relapsed after the second year of recovery. Among late relapsers, stress, coupled with increasing denial and slacking off treatment activities, preceded relapse despite the fact that powerful contingencies were still in place. The authors identified multiple factors that led to relapse, but noted that those physicians with successful recovery were those who became active AA participants, espoused a spiritual pathway, effectively dealt with compulsive behavior such as overwork, and improved interpersonal and family relationships.

In reviewing the importance of AA participation, Galanter et al¹² evaluated a subsample (n=120) of 550 alumni of the Impaired Physicians Program of Georgia who had elected to attend an annual retreat. All the participants had completed all phases of the Georgia program, including the halfway house program and continued care contract. A research questionnaire containing 160 items related to demographics, professional activity and drug use and a standardized General Well-Being Schedule were completed by 100 of the 120 eligible physicians. Respondents also were asked to complete attitudinal and self-assessment items, with treatment components rated for the degree to which they contributed to the respondent's recovery. Average self-help attendance was 5.5 meetings per week, and 71 had spoken to their sponsor during the previous week. In addition, 54% were still receiving some form of psychotherapy. Most (95%) were practicing medicine, with an average of 38 hours of patient care weekly. AA was perceived as the most potent element in the recovery of many of the participants, with most committed to the AA principles and the importance of fellowship. The most committed AA members went to the most meetings and were presently sponsoring other members. Older physicians were more likely to be involved in

sponsorship, less likely to be in psychotherapy and more likely to be professionally involved in the field of addiction medicine. Most (84%) of the physicians reported continued abstinence since treatment began, with the remainder reporting they had only a brief slip. The authors concluded that three psychological factors, including shared beliefs, group cohesiveness, and mutual identification, were influential in this group's successful outcome.

The question of whether successful treatment of impaired physicians results in improvement in their clinical practice is of major public health importance. Clearly, the studies reviewed in this article demonstrate that treatment is successful in that the physicians return to medical practice and improve functioning in most areas of their

Further research is necessary to delineate the relative roles of family history and concurrent spousal substance use.

lives. One would expect that improved communication skills and a stable emotional state would improve the physician-patient relationship and the quality of medical care rendered. However, determining if the overall health improvements generalize to actual medical practice performance is more difficult to obtain once physicians finish residency training. Pelton et al¹³ report from the Medical Board of California Diversion Program on their 10-year experience in monitoring physician outcomes, including data on practice-related complaints to the licensing board. From 1980 to 1990, more than 600 physicians were formally investigated by the board; 257 had completed their 2 to 3-year treatment/monitoring contract and 135 were terminated from the study secondary to death, relocation or failure to comply with treatment recommendations. Data from their central registry on complaints and violations were collected, and converted to the rate of complaints per 1000 physician exposure years. The 257 successful graduates of the diversion program had a complaint rate of 4.2%, compared to 6.7% for all licensed physicians in California over this 10-year period. Approximately 25% of the complaints of the diversion program graduates were related to relapse, half of which occurred within 2 years of treatment graduation. More than a third of the complaints regarding diversion program graduates were closed secondary to insufficient evidence. Clearly these data support the clinical impression that treated physicians are no more (and perhaps even less) of

a risk to the public than other physicians, and that treatment improvements do carry over into practice-related behaviors.

Conclusions and Implications

The articles reviewed in this paper suggest that treatment is quite effective. However, asking the question "Does Treatment Work?" requires further specification of what is meant by treatment and who is being treated. Since human behavior is extremely complex, treatment outcome research is difficult to perform. Data collection from treatment programs or medical societies are usually reported at a "macro level," based upon clinical definitions (eg, alcoholic or drug abuser) without the use of standardized assessment or severity tools, (eg, Addiction Severity Index, Alcohol Dependence Scale, Structured Clinical Interview for DSM-III-R, or Clinical Institute Withdrawal Assessment Scale). Well-known predictors of treatment outcome such as demographics, severity of alcohol and drug dependence, extent of psychiatric co-morbidity, the quality of family/social relationships, and family history of substance dependence or mental illness are rarely measured in a manner that allows for cross comparison and statistical analysis.

In many of the articles reviewed in this paper, the authors attempted to quantify the severity of the alcohol and drug dependence and determine its contribution to subsequent outcome. There have been conflicting results between studies partly because severity was not measured in a standardized fashion, and polydrug dependence often clustered with other variables such as younger age and the extent of psychopathology. For example, Morse⁵ noted no difference in outcome comparing those physicians with mild problems and no professional consequences to those with multiple admissions and significant professional restrictions, yet noted poorer outcome for physicians with combined dependence, perhaps related to the higher degree of psychopathology. The experience of the Georgia Impaired Physician Program is skewed towards more severe dependence and professional consequences, yet these physicians often do quite well both in terms of abstinence and rate of success of resumption of medical practice. More comprehensive and standardized measurement may clarify these inconsistencies.

In most of the studies, the family history of alcoholism or mental illness was rarely reported. Developmental functioning, physical or sexual abuse, parenting styles, birth order, the extent of parental problems causing interference in family rituals, and chil-

dren's role in family functioning may be significantly effected by parental alcoholism or psychiatric dysfunction. Gallegos and colleague's study¹⁴ of 139 physicians discharged in 1988 from the Georgia program indicated that 86% had a family history of alcoholism, with 55% having alcohol and/or drug dependence in one parent. When both parents were chemically dependent, the physician-patient was more likely to start substance abuse at an earlier age and seek treatment earlier. Flaherty and Richman¹⁵ in their extensive longitudinal study on medical students and residents, reported that while 44% of substance-abusing medical students had a positive family history of alcoholism, only 11% of non-substance abusing students had a positive family history. Clark and Daugherty¹⁶ in a similar study noted that 22% of a medical student class reported a positive family history of alcoholism (first degree relatives) and that those students who reported a history of alcohol abuse and/or a positive family history on the first day of medical school were more likely to continue to abuse alcohol for the remainder of the medical school training. Although it is not yet clear the relative contribution of genetic or environmental factors in determining increased vulnerability, it still remains that a positive family history is probably an excellent predictor and should be measured in more detail in future studies.

More carefully controlled research studies recognize the prognostic contribution of co-existing mental health problems, marital conflict and personality type.^{17,18} Edwards et al¹⁹ have examined relationships between pretreatment intake characteristics and long-term remission of alcoholism and were unable to find any prognostic value of pretreatment intake characteristics when single correlational techniques were used in the analysis. However, when more sophisticated analytic techniques were used, they identified two subgroups of patients: non-dependent alcohol abusers with good health and social adjustment and alcohol-dependent persons with multiple psychological and social problems. Others²⁰ have suggested that any one individual characteristic was not as helpful prognostically as the clustering of childhood risk factors, psychopathology, and age of onset into clinical groupings. It is difficult to extrapolate these findings to a physician population since the type of psychopathology differs (antisocial vs borderline), and the extent of social support and demographic characteristics differ from the general substance abusing population. However, in the studies reported in this

paper from Menninger Hospital and Mayo Clinic, significant negative childhood experiences was correlated with younger age, polydrug abuse, borderline personality profiles and depression, and resulted in poorer outcome. Furthermore, although significant marital discord as a pretreatment variable is frequently noted, substance use histories of the immediate family members of the physician in treatment are rarely reported. Johnson and Connelly³ did note that 6 out of 43 physicians' spouses were also chemically dependent and required concurrent treatment. Further research is necessary to delineate the relative roles of family history and concurrent spousal substance use.

Most of the studies suffer from selection bias and lack of a matched control group. Those studies that attempted to compare physicians to non-physicians did so globally, without controlling for similar variables such as demographics, substance use history, extent of coercion, and involvement of contingency contracting or urine monitoring. For example, the extent of coercion has not been quantified, with many studies clumping voluntary self-referred patients with those who are being forced into treatment secondary to powerful external forces. Furthermore, many studies do not specify combinations of severity indicators, and often report, for example, those physicians with legal/regulatory problems as having severe problems, when the act of getting caught (driving under the influence and DEA violations for self-administration of controlled substances) may be a form of earlier identification. Most of these studies have not been representative of the larger physician population, with under-representation of female physicians, uneven specialty distributions, and wide variations in age, drug use and extent of coercion. For example, in terms of specialty area, the treatment outcome of anesthesiologists has been compared with those of other specialties. This analysis is difficult because not only do anesthesiologists have much higher incidence of parenteral drug use, they have unique workplace related drug availability issues compared to other specialists. Several studies on non-physicians have found that exposure to drugs (cue exposure) may have a profound negative effect on one's recovery.²¹ Therefore, direct handling of drugs may represent a high risk situation for those anesthesiologists who are cue reactors. Menk et al²² have suggested that impaired anesthesiology residents should change careers because of the high incidence of relapse when they are allowed back into anesthesia training. The Menk

study used residency training directors reports and a single relapse as outcome process/measures. These results were challenged by Pelton and Ikeda²³ who in their review of the outcome of 51 anesthesiologists noted no difference in the rate of program completion, or in their rate of relapse compared to other physicians.

Clearly further study between and within specialty areas is needed that takes into account the unique characteristics of the specialty and those of the individual physician.

The lack of a "gold standard" for treatment has allowed the health care industry to make changes based upon economic factors and attitudinal biases. Managed care forces have permanently altered substance abuse delivery systems, as evidenced by a significant reduction in the number of private inpatient rehabilitation beds, and closure of two of the largest substance abuse treatment programs in Rhode Island. It is ironic that many of the treatment programs reviewed in this article would most likely not be available to physicians under their present insurance coverage. Most of them would not meet medical necessity criteria for this level of care. Most Rhode Island physicians treated within the last few years received their initial treatment on an outpatient basis. The relative effectiveness of outpatient treatment as compared to inpatient will need further study.

A recent analysis attempted to address level of care (ie, inpatient vs outpatient) for a physician population. Smith and Smith²⁴ analyzed data from the Oklahoma Physician Recovery Program and Board of Medical Licensure for 120 physicians from 1984 to 1989. The type of treatment was broken down into 3 types: inpatient physician specialty treatment, inpatient nonphysician specialty chemical dependency treatment, and other (outpatient, psychiatric or self-help group attendance). Outcome was categorized and compared to treatment type. Most (85%) physicians treated in inpatient physician specific treatment programs of long duration (similar to Georgia's) followed by outpatient treatment had a favorable outcome, compared to only 37% for general inpatient chemical dependency treatment. The poorest outcome occurred in the "other" category with 67% having major relapses and 14% death or involuntary loss of licensure. The authors did not present severity profiles of the physician populations within each treatment type. The data suggest that level of care (as well as physician specific programming) is an important determinant of treatment outcome.

Although typically it has been difficult to prove for groups of patients that one treatment modality is better than another, carefully controlled treatment outcome studies have attempted to analyze such factors as the setting of treatment (inpatient vs outpatient), the duration (shorter vs longer lengths of stay), the conceptual framework (disease concept vs social learning theory), therapist characteristics, expectancies towards treatment, and the components of treatment such as group vs individual counseling, marital/family therapy, relapse prevention, aftercare components, self-help participation, and the use of medication. Many researchers have begun to study the efficacy of assigning interventions based upon patient characteristics. Such efforts have been called patient-treatment matching and have yielded some promising results. One of the authors of this paper (TN) has been involved in one of the largest national multicenter studies to date, entitled Project MATCH, which may help clarify optimal treatment pathways and have important clinical implications.²⁵

The very high success rates frequently found in the reviewed studies examining physician treatment could be explained by a naturalistic implementation of patient-treatment matching. The components of most programs were based upon the unique characteristics of the physician population and are reflected locally in the treatment and monitoring processes within the Rhode Island Medical Society's Physicians Health Committee. For example, interventions occur that optimize earlier intervention and self-referral, and involve peer support and identification. Coercion parallels the extent of physician problems and is not artificially applied legislatively and treatment recommendations are made by experts matched to the nature of the complaint or referral source. Examination of patient treatment matching in the physician population may be quite fruitful.

The authors of this paper have direct knowledge of this process by serving as a member of the Physicians Health Committee (JF) and co-leading (JF & TN) one of the medical society's sponsored physician support groups. Similar to the findings of earlier studies we have found a very high compliance rate. Of note, those patients with poor outcomes have had a less significant coercive component and/or have already experienced multiple personal failures such that loss of licensure no longer

was valued as a powerful factor. We also have observed a high prevalence of family and interpersonal problems, and a high incidence of positive family histories of alcoholism. We highly recommend comprehensive family evaluation and now offer a formal couples group for professionals. We also are impressed that although some of the physicians are not active in self-help groups, they continue to do well. Clearly, increasing the duration of treatment and monitoring are powerful factors in improving outcome.

We still need more systematic and comprehensive research that will help guide treatment delivery and improve its effectiveness. The treatment advocacy and monitoring provided by a medical society sponsored physician health committee creates an excellent environment to conduct treatment outcome studies. We are planning to obtain more systematic information on the outcome of those physicians identified and monitored by the Rhode Island Medical Society's Physician Health Committee. Fortunately, we no longer have to justify intervention and treatment based only upon case reports. Clearly many physicians who participate in the medical society's advocacy and monitoring program show remarkable and sustained improvement. Recovering physicians are not only effective as practitioners, but also frequently act as role models and help carry the message to other colleagues that substance abuse treatment works.

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Psychiatric Issues in Physician Impairment

Patricia Wold, MD, and Steve Karlin, MD

It is difficult for those who work in the service of others to accept the patient role. Additionally, despite our education and training, physicians may not be immune to the persistent stigma of mental health treatment.

Physician health committees often are associated with intervention and advocacy in cases of substance abuse or dependence as well as cases involving reported irregularities of the doctor-patient relationship. Indeed, the Physicians' Health Committee of the Rhode Island Medical Society (RIMS) does spend the bulk of its efforts in these directions. Nevertheless, many cases involve the primary identification of behavioral or psychiatric issues. This article seeks to address the common psychiatric problems encountered, serving as a practical guide to enhance identification and treatment of colleagues in distress.

A review of the 37 cases presented to the committee over the past 3 years may serve as a starting point. In 17 cases the focal problem involved a psychiatric disorder or a behavioral issue. In 2 other cases, evaluation of a primary substance abuse problem revealed the clear presence of concurrent depression. Of these 17 cases, 8 involved reports of inappropriate doctor-patient relations or sexual misconduct and 9 others involved psychiatric disorders or behavioral problems with staff or colleagues. Examination of these 17 cases led to the identification of a mood disorder in 5 with major depression (3 cases), milder depression or dysthymia (1 case) and bipolar disorder (1 case). Suicidality was the initial focus in 2 of the depressions. Personality disorders or problematic personality styles were identified in 6 cases as problems when characteristic patterns of dealing with work and relationships led to complaints. Anxiety disorders, time-limited adjustment disorders and attention deficit disorders were found in single cases. Thus the major problem areas—*affective disorder, suicidality, and personality disorders*—will guide our discussion.

While we have used a review of cases over 3 years as our guide, the diagnostic

categories are those expected given the high incidence of these problems in the general population and the sampling bias expected in a population of high-functioning professionals. It must be acknowledged, however, that the well-known intermingling of psychiatric and substance abuse problems makes distilling out psychiatric problems difficult. As with our "dual diagnosed" patients, we realize that chemical dependency can be an effort to self-medicate an underlying psychiatric illness that will be revealed when the drugs or alcohol are gone; we suspect that this led to an under-estimate of psychiatric issues in physician impairment. At other times, substance abuse will lead to a secondary organic mood syndrome mimicking a primary psychiatric disorder; alcoholism may present as depression and cocaine use may yield mania or paranoia. Nevertheless, psychiatric disorders are common and thus are to be expected among our peers.

Affective disorders are common syndromes, constellations of symptoms persisting over time. They are divided into depressive disorders and bipolar disorders. There are two depressive disorders: **Major depression** and **Dysthymia**. Major depression has a surprisingly high prevalence. Studies have reported that 9% to 29% of females and 5% to 12% of males have had this disorder at some point. This sex ratio of 2:1 as well as a clustering in families is well described. While it is episodic with normal function between episodes many individuals have increasingly intense or frequent episodes as they age, and in 20% to 30% of cases there may be a more chronic course without full return to premorbid functioning.

The characteristic symptoms of depression include depressed mood and changes in appetite and sleep. The typical depression shows decreased appetite and insomnia whereas atypical depression involves overeating, weight gain and hypersomnia. We may also recognize in depressed colleagues a loss of concentration, flagging energy, comments about guilt or worthlessness, thoughts of death or suicide, and di-

minished interest or pleasure. Persistence of these features for more than 2 weeks is of concern. Depressed colleagues may not be sad or "blue" but may complain of a distinctly different feeling described as "gray," "empty," or "bleak."

Dysthymia involves a chronic depressed mood experienced on most days for more than 2 years. Associated symptoms include sleeping or eating changes, low self-esteem, fatigue, poor concentration and hopelessness. The disorder endures and is without the severe episodic, acute quality of major depression. Nevertheless its chronicity is disabling, and its less dramatic quality leads to under diagnosis. While long considered primarily psychological, developmental or "neurotic," biologic clinicians point to the frequent responsiveness of this condition to biologic therapies, placing dysthymia in the continuum of biologic mood disorders. Colleagues who are always dour, self-degrading, and pessimistic, may be thought to be "just that way" but may be missing the opportunity for treatment.

Bipolar Affective Disorder is divided into Bipolar I, Bipolar II, and Cyclothymic Disorder. In **Bipolar I Disorder** people have severe clinical depression usually with hypersomnia and hyperphagia alternating with periods of hyperactivity typically characterized by a decreased need for sleep (2 to 4 hours in 24 hours), high energy, frenetic activity, often excess drinking and other behavior that is out of character for the individual. This high energy lasts from 1 week to several months and may be followed by depression or a period of normal mood that can last several months or years. Although the depressed periods are uncomfortable enough to both the patient and family to motivate a person to seek help, the manic phase is usually denied by the patient who never felt better in his/her life and may

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ABBREVIATIONS USED

AMA: American Medical Association
APA: American Psychiatric Association
RIMS: Rhode Island Medical Society

be engrossed in projects to make money, or gambling to "make a million." Bankruptcies are significantly more frequent among bipolar families. If a colleague is making claims of fortunes to be won in investments, not paying bills, having a series of affairs, talking loudly at parties or professional meetings, bipolar disorder should be suspected. Speech is usually rapid with constant interruptions of anyone who tries to converse. Such a person will take control of the interview and soon have your office rearranged if possible. Furthermore you can't get the person out the door; further subjects will be introduced endlessly. Despite the euphoria, lines of depression often can be seen in the face presaging the oncoming downturn. This event is frequently explained as having burned oneself out. The temptation is to prescribe a vacation rather than to make a diagnosis and get treatment for the condition. The depression that follows is severe, and the person may be acutely suicidal. The depletion of energy results in the person staying in bed for days at a time or dragging to work where he/she functions poorly. There is now great difficulty concentrating, thinking is slowed, and often the person craves sweets and may put on 10 to 20 pounds. A colleague who doesn't show up for rounds, has difficulty concentrating on paper work or patient care, or complains about being tired may in fact be depressed.

Bipolar II Disorder has the same kind of depression but the intervals of high mood are less intense (hypomanic). They are often not recognized as abnormal since the person seems in such a good mood. However, it is not uncommon for friends to ask if the person has been taking any drugs. It may be a time of partying, of sexual adventures, or of impulsive decisions such as suddenly leaving a marriage of some years or changing jobs. Sometimes the high energy periods spark highly creative times when a great deal is accomplished. However, this productivity is uneven since it stops as soon as depression occurs. These people may be highly accomplished and in positions of authority so that some of the hypomanic behavior can be seen as related to the position and periods of being away from the job when depression occurs can be more easily hidden.

Cyclothymic Disorder is characterized by shorter periods of both depression and hypomania, ie, 2 or 3 days. There may or may not be periods of normal mood intervening. Irritability is very often the most prominent symptom alternating with painful depression. The impulsivity sometimes

results in violent outbursts, spending sprees, and poor decisions that may involve family, patients or finances. Colleagues who are in serious debt despite an active practice should be suspect for bipolar disorder. Alcohol and drug abuse is common as the person attempts to self-medicate the condition. The cyclical mood disorder may become apparent only when the person has become abstinent since it is frequently complicated by substance abuse. Colleagues who are given to temper tantrums or are repeatedly in conflict with hospital staff may have a personality disorder or may be suffering from a treatable form of bipolar disorder.

Treatment

The treatment for affective disorders starts with diagnosis and the exclusion of organic factors. Toxic and metabolic factors that can cause depression include anti-hypertensives, steroids, paraneoplastic syndrome, viral illness, CNS disease and endocrinopathies. Once diagnosed, treatment involves psychotherapy and pharmacotherapy. It is often difficult for those who work in the service of others to accept the patient

Self-prescription of a psychoactive drug is an ominous sign. More than half of the completed suicides by physicians had self-prescribed medication.

role. Additionally, despite our education and training, physicians may not be immune to the persistent stigma of mental health treatment. While dramatic major depression and bipolar disorders are easily seen and brought to treatment, milder cases, chronic major depression, dysthymia and cyclothymia can go untreated. The efficacy of antidepressant and mood stabilizing agents such as lithium, carbamazepine, and valproic acid, can be profound, resulting in marked improvement in productivity and patient care.

Suicidality is a complaint that deserves special attention. It has been estimated that there are 75 completed suicides daily in the US or a suicide every 20 minutes.

Based on these national rates, one Rhode Island physician may be expected to commit suicide each year. Predicting suicide is unreliable, however, because the act is contingent upon a changing mental status and variable stressors.

The Coustan and Rakatansky 1989 report on suicide indicates that certain established risk factors can help to assess short-term risk, since suicide is often prevent-

able.¹ Most physicians are adept at concealing suicidal intent and remarkably efficient with 62% of attempts resulting in death. In the AMA-APA Joint Study on Physician Suicide published in 1987 the editorial elaborated on the characteristics of physician suicide in the hope of increasing recognition of individuals at risk.² The following key factors were identified in 142 physician suicides:

- Physicians often signal their intentions of suicide. Half of the suicides had talked of taking their life the 2 years preceding death.
- Prior suicide attempts are a clear risk factor; 34% of those in a suicide group had made prior attempts.
- Self prescription of a psychoactive drug is an ominous sign. More than half of the completed suicides by physicians had self-prescribed medication.
- Financial, personal or professional loss poses additional risk.
- Drug and alcohol dependence presage possible suicide.
- There is a characteristic personality style that receives or gives little emotional support to or from family, colleagues, or friends.
- Physical or mental health problems are common.
- Depression is a major risk factor.
- Family history of chemical dependence or mental illness is common.
- Troubled family of origin and difficult childhood were often noted.

Completed suicides occur most often in men, with a male:female ratio range of 2:1 to 7:1. Single individuals have a two-fold risk over married, and divorced, separated, and widowed people present 4 to 5 times the risk. The suicide risk also increases with age, especially over 45; this finding may reflect that significant physical illness is estimated in 11% to 50% of suicides. Diseases, such as MS, epilepsy, AIDS, and endocrine disorders are associated with an increased suicide risk, perhaps because of their associated organic depressions.

An increased risk of suicide among physicians has been debated for years. Most US studies suggest that the annual rate of physician suicide of 36:100,000 is akin to the rate for the nonphysician population. US female physicians, however, may present a somewhat higher than expected risk at 41:100,000. Most physician suicides occur in the context of mental health issues, especially depression, drug abuse and alcoholism, and studies confirm the association with stressors—personal or professional.

The suspicion of suicidal intent in a col-

league requires immediate attention. If a colleague mentions a specific method of self-harm, gives away personal effects, or expresses self-blame or lack of interest in living, it is important to approach the colleague or those close to him/her or even the family. The goal should be to get them into therapy with a psychiatrist. The Physician's Health Committee may also be sought to provide the initial approach to assess suicidal risk and, associated mental health problems. If you are uncertain whether a colleague is a risk for suicide, a member of the committee will be glad to discuss these concerns confidentially.

Personality Disorders occur when per-

... the unavoidable losses and failures inherent in our work may lead to a shattering of defenses with a deeply felt narcissistic injury, depression, or substance abuse.

sonality traits become maladaptive, inflexible, and lead to functional, social or occupational impairment, or subjective distress. Our character or personality represents the enduring pattern of thinking about, perceiving and reacting to ourselves and our environment, and determines our personal and social attitude. While a discussion of the derivation of personality disorders is beyond the scope of this paper, some general comments may prove useful.

Personality traits are automatic, ingrained and part of our constitution. They may not be problematic or distressful until a crisis at work or home brings out the maladaptive aspect. Central to personality theory is the notion that we adopt defensive styles to deal with our unique developmental stresses, and our predominant defenses color our personality. As expected, personality types gravitate toward roles in which their defenses are well suited.

Obsessive Compulsive personality traits are often rewarded in medicine. Years of study and scientific rigor may select out individuals who are orderly, controlled, rational, disciplined and intellectualized. The characteristic defense here involves an isolation of affect from experience; difficult emotions are dissected away leaving the rational or cognitive approach alone. This separation of emotion from experience can be very adaptive for physicians faced with human suffering and pain. Unfortunately this personality also implies a dulling pre-

occupation with detail, rigidity, never-satiated perfectionism and a precarious distancing from our feelings. While these traits may work well in achieving professional goals, they can wreak havoc with a marriage where this attention to order and detail may be expected from spouse and children at the expense of concern for emotions. Nurses or office staff may have their feelings ignored. It can be a set-up for unhappiness, stress, and ultimately major depression and psychosomatic disorders.

Similarly narcissistic traits, roughly translated as the investment of energy in oneself, can be selected out in medicine. Often pursuing scholarly and prestigious positions like medicine, the self-involved individual seeks accomplishment and achievement. The preoccupation with success, power and authority can be seen as a defense against the human fragility, uncertainty and insecurity that lurks below. We can achieve great career status at the price of avoiding our powerlessness, limitations, and doubts. Here, unfortunately, the unavoidable losses and failures inherent in our work may lead to a shattering of defenses with a deeply felt narcissistic injury, depression, or substance abuse. Similarly, the increasingly complex and stressful interactions of modern medicine, such as peer review, quality assurance, and managed care can be experienced as threatening attacks by those accustomed to assuming control, leading to conflict in the workplace.

These character issues are often presented as problems when they culminate in

depression or suicidal ideation. People with personality disorders are known to be at risk for suicide and treatment of these cases focuses on this as well as the underlying depression. Interpersonal conflict and discord with hospital staff brings others to attention: psychotherapeutic techniques may be useful in diminishing the crisis and in making useful modification in these characteristic patterns.

Many of us are reluctant to let ourselves perceive problems in respected colleagues, particularly if they hold positions of power whether or not this affects us. We naturally identify with other doctors, are aware of the unique stresses of medicine as others may not be, and are consequently inclined to rationalize observed danger signs. However well-intentioned, this is no more a kindness than it would be let an early tumor go untreated. Psychiatric disorders are eminently treatable and early intervention can save both families and careers.

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On Seduction and Exploitation: A Medical Model Approach

Richard Irons, MD

Abuse of power and position for control and personal gain within the physician-patient relationship has been recognized since ancient times. Warnings, admonitions, and codes of conduct can be found in virtually all major healing traditions. Since the time of Hippocrates, it has been recognized that the unique nature of the doctor-patient relationship is threatened and distorted by intimate emotional or sexual contact.

Professional sexual misconduct and offense are emerging from secrecy as compelling issues that threaten public welfare and safety while eroding trust in our profession."

Let us define two types of professional sexual impropriety: 1) Professional sexual misconduct is the overt or covert expression of erotic or romantic thoughts, feelings or gestures toward the patient that are sexual or may be reasonably construed by the patient as sexual; 2) Professional sexual offense is the non-therapeutic, non-diagnostic attempt by the physician to touch, or actual contact with, any of the anatomic areas of the patient's body commonly considered reproductive or sexual. Offense may also involve forcing, coercing or manipulating the patient to attempt to touch the physician in these anatomical areas.

The relationship between physician and patient is considered bounded, protected and fiduciary, and any type of professional sexual impropriety represents a breach of trust and an ethical violation. Others affected or potentially exploited include employees, coworkers, students, and peers. Individuals who believe a professional has engaged in potential sexual misconduct or offense and have mustered the courage to report allegations of misconduct will be referred to as complainants. It is beyond the scope of this paper to discuss the symptoms and dynamic effects that sexual violation has upon its victims, but it is important to

emphasize that involvement in sexual or romantic activity by patients with their physicians is never considered consensual. The effects of such a liaison upon the patient are almost always detrimental, and violate the ethical principle to first do no harm (*primum non nocere*).

The American Medical Association's Council on Ethical and Judicial Affairs has concluded that professional sexual activity between a doctor and patient is always unethical.¹ In its most recent policy statement, it states:

Sexual contact which occurs concurrent with the physician-patient relationship constitutes sexual misconduct. Sexual or romantic interactions between physicians and patients detract from the goals of the physician-patient relationship, may exploit the vulnerability of the patient, may obscure the physician's objective judgment concerning the patient's health care, and may ultimately be detrimental to the patient's well-being.

The current rate and prevalence of professional sexual misconduct is difficult to document. Gartrell, in a recent study that attempted to survey sexual activity between

A statement of the complainant(s) description of events is crucial and should be obtained before beginning any evaluation.

patients and medical physicians and surgeons, estimated that about 9% of doctors surveyed were sexually involved with at least one of their patients within their professional role.² This approximates estimates published in the literature of sexual involvement between psychiatrists and patients, as well as psychologists and their patients. Clearly the phenomenon of sexualized transference and countertransference extends beyond the treatment of mental illness. There are no published comprehensive outcome studies on the assessment or treatment of sexually exploitative health professionals in the medical literature.

These issues take on immediate impor-

The relationship between physician and patient is considered bound, protected and fiduciary, and any type of professional sexual impropriety represents a breach of trust and an ethical violation.

tance when events occurring between a physician and patient lead to an allegation or formal complaint of professional sexual misconduct or offense. I have served as medical director of assessment programs that have formally evaluated more than 150 physicians, clergy, and lawyers who have been accused of such improprieties. These assessments are short-term (usually 5 days) inpatient or day hospitalizations that provide independent, objective, multi-disciplinary assessment for possible mental illness and professional impairment associated with such allegations.

Our experience with such assessments of professionals forms the basis upon which this approach to classification and diagnosis of such problems has evolved. This assessment model was developed in response to the needs expressed by licensure boards, regulatory agencies, professional organizations and the public to have an objective forum in which allegations of sexual harassment, professional sexual misconduct, and professional sexual offense could be explored and considered independent of treatment, administrative due process, civil suits, and criminal legal proceedings. It is not intended to be a substitute for the finding of facts and adjudication inherent in legal proceedings, but rather an alternative or supplementary means by which an impartial inquiry into the physical and mental health of the accused professional may be conducted. Possible personal vulnerabilities, mitigating circumstances, and errors in judgment that may have contributed to the allegations can be considered within the medical model, and diagnoses and recommendations made by the entire team through clinical staffing may be accepted and implemented as deemed appropriate by all concerned parties.

Professional sexual misconduct and professional sexual offense present with a wide

ABBREVIATIONS USED

DSM: Diagnostic & Statistical Manual
NOS: Not otherwise specified

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and diverse array of scenarios as outlined in Table 1. To define precisely the type and severity of professional impropriety, and to make accurate and appropriate diagnoses, it is important to gather as much information as possible about the events leading to assessment including the specific nature of the thoughts, feelings, and actions that occurred between the physician and the complainant.

A statement of the complainant(s) description of events is crucial and should be obtained before beginning any evaluation. A sexually exploitative professional may use more than one scenario or may use variations on a given theme. In our experience, however, the behavior in question is often ritualized and compulsive. Once the evaluator has been able to compare the physician's version of events with that of the complainant, it usually becomes possible to construct probable scenarios and begin to establish a causal hypothesis on how and why the misconduct or offense may have occurred.

Professional sexual improprieties can be classified into one of three major categories: paraphilia, psychosexual disorder, or work-related problem.

A paraphilia is defined in the *DSM III-R* as a desire to engage in a sexual activity that is considered outside societal norms (ie, deviant). The patient has either acted on these desires or is markedly distressed by them.

A psychosexual disorder is defined as distress in a pattern of sexual activity associated with sexual performance that fails to provide intimacy, safety, and responsibility within relationship and not associated with a paraphilia.

When the behavior and scenario do not easily fit into either category, and is not considered a direct symptom or manifestation of some other *DSM III-R* Axis I diagnosis, then we have used the work-related problem (V62.2) descriptor.

A complete listing of possible Axis I diagnoses associated with professional sexual misconduct or offense is presented in Table 2. Our assessment team members have found it helpful to complete the differential diagnosis on Axis I before considering Axes II and III. Psychosexual disorders and paraphilias, when identified, should be described precisely. If the NOS category is used, then it is important to use appropriate descriptors that define the features seen. In our program the most frequent features noted besides specific paraphiliac behaviors are those of addiction, exploitation, predation, romance, and assault. The severity of

Table 1.—Common Sexual Impropriety Scenarios

Romantic enmeshment with patient or co-worker
Use of power and position to advance sexual agendas
"Fatal Attraction" enactment of rescue fantasy
Paternal or maternal nurturance of a younger patient
Involvement with family member of patient
Medical frotteurism, voyeurism, or exhibitionism
Unnecessary or over-extensive genital examination
Rude/abusive/insensitive/verbally inappropriate solicitation
Surgeon offering "sexually enhancing" procedures or offering sexual therapy for a patient's sexual or relationship problems
Cultural dissonance between physician and patient becomes sexualized
Molestation of patient who is physically, mentally, or emotionally unable to offer resistance or is under the influence of mood-altering substances
Attempt by physician to resolve conflicts involving sexual preference
Unconscious reenactment of incestuous desires or past sexual abuse

the disorder, duration, current level of activity, and amenability to treatment should also be presented.

Some cases involving professional sexual impropriety are associated with and are at least partially attributable to characterologic pathology. At times it is essential and appropriate to diagnose a personality disorder during assessment or treatment. This characterologic diagnosis can be the primary diagnosis for an exploitative professional, or the patient can be viewed as having co-morbid conditions involving an Axis I diagnosis and an Axis II diagnosis of characterologic pathology.

Many mental health professionals are reluctant to make a diagnosis of personality disorder, and such a diagnosis is viewed by some as a characterologic curse—immutable, untreatable or poorly treatable, and indicating a poor prognosis. Our team members retain the philosophy that defects of character often are part of addictive disease and other types of destructive or self-defeating behavior and that identified defects

are treatable if the patient is capable of honesty and at least partial insight. Dramatic characterologic change is seen as part of personal transformation often experienced through dedicated participation in 12-step programs, insight-oriented or analytic therapy, and other avenues that promote spiritual awakening. Certain types of medical problems can be associated directly with professional sexual impropriety in particular, medical problems that contribute to organic mental disorders. They are listed in the *DSM* classification under Axis III diagnoses.

Recognition of one or more diagnoses that substantially contribute to professional sexual misconduct and sexual offense often, though not always, will be found during a comprehensive multi-disciplinary assessment. It is helpful to recall that some diagnostic entities may overlap.

In the medical and mental health literature a number of practical typologies of sexually exploitative professionals have been presented over the past few decades. In our assessment experience, I have found that the following archetypal categorization has been useful in describing professionals who have engaged in sexual impropriety to concerned parties who are not trained or fluent in psychiatric diagnostic nomenclature:

The naïve prince—Early in his career, the physician feels powerful and invulnerable. He develops "special relationships" with patients characterized by blurred roles and boundaries.

The wounded warrior—Overwhelmed by professional demands, and dependent on his professional status for personal validation, vulnerability and desire for escape from oppressive responsibility leads this physician to involvement with patients who offer personal affirmation and gratification.

The self-serving martyr—The physician's work has become his life and results in isolation, depletion, anger and resent-

Table 2.—Possible *DSM III-R* Diagnoses Associated with Sexual Misconduct Other than Sexual Disorders

Paraphilias
Psychosexual Disorders
Gender Identity Disorder
Organic Mental Disorder
Erotomanic Delusional Disorder
Bipolar Affective Disorder
Obsessive Compulsive Disorder
Atypical Dissociative Disorder
Impulse Control Disorder
Adjustment Disorder (with disturbance of conduct)

ment. Feeling existentially stuck in middle or late career, he engages in romantic or sexual interludes with selected patients.

The false lover—Enjoying the loves and the appetites of the senses, living on the edge, and in the thrill of pursuit and seduction, he is often sexual in as well as out of medical practice and is often chemically dependent.

The dark king—Possessing charm, charisma, success, and skill in manipulating others, he engages in sexual exploitation as an expression of power and dominance while expressing severe characterologic pathology.

The wild card—Significant dysfunction in personal and professional life is seen with episodes of sexual acting out associated with exacerbations of DSM Axis I psychopathology other than sexual disorder or addiction.

Although not classical Jungian archetypes, these often facilitate recognition of sexually exploitative professionals and assist in the explanation and utilization of the medical model approach advocated in this paper. This classification takes into account the metaphors with incest that are seen with physician sexual impropriety in most cases, and relates the acting out behavior to inner wounds, vulnerabilities, and personal physical and mental pathology that commonly exists if it is sought.

In a presentation to the American Society of Addiction Medicine at their 1994 Medical-Scientific conference, Dr Jennifer Schneider and I described the preliminary results from a retrospective review of 137 professionals alleged to have engaged in professional sexual indiscretions:

- 85% were physicians; all completed a formal multi-disciplinary assessment in our program.
- 24% of the physicians claimed internal medicine as their primary specialty, 23% family practice, 15% psychiatry, 12% surgery, 9% obstetrics and gynecology, 7% emergency medicine, and 7% pediatrics.
- They were referred from 33 states and several provinces of Canada.
- They ranged in age from 28 to 63.
- 85% were Caucasian and 11% Asian.
- 70% were married at the time of assessment, 12% separated, 10% divorced, and 9% single.
- 90% claimed to be exclusively hetero-

sexual, 6% homosexual, and 4% bisexual.

- 93% of the professionals were found to have work-related problems related to sexual conduct.

Sixty-six percent acknowledged sexual exploitation in their professional practice, and in 27%, such exploitation was not found to be present, based on the information available. In 7% of the cases, the professional denied exploitation while collateral information was felt to be credible, therefore the assessment results were felt to be inconclusive. It is of interest that 65% of these professionals were diagnosed with a sexual disorder, usually a paraphilia, while 30% did not meet diagnostic criteria. Even so, 86% of this sub-population of 41 professionals without a defined sexual disorder were still felt to have work problems related to their sexual conduct.

In the entire sample of 137, 58% were

Most can be helped, and we have seen that it is possible for carefully selected professionals to return to professional life at some time in the future with supervision and under carefully drafted and monitored recovery contracts.

determined to be professionally impaired at the time, and 10% potentially impaired. We recommended inpatient treatment for 49% of the professionals, and outpatient treatment for another 43%. No treatment was recommended for only 2% of our study population, the three professionals in whom we believed the allegations were false or grossly exaggerated. In 10 cases (7%) treatment recommendations could not be made since the assessment results were inconclusive.

Of the 88 patients in our study diagnosed with a sexual disorder, 73% were defined as sexually exploitive in their professional practice, 87% had work-related complications, and 85% were found to have addictive features associated with their disorder. Thirty-eight percent (33) were diagnosed with chemical dependency.

In the patients who were determined to have engaged in professional sexual exploi-

tation, 8% fit into the archetype of naïve prince, 31% into wounded warrior, 18% into self-serving martyr; 20% were seen as false lovers, 14% as dark kings, and 9% as wild cards.

These preliminary results suggest that professionals alleged to have engaged in sexual impropriety referred for formal assessment are a diverse population of almost exclusively men, who will be found to have one or more of a wide array of diagnosable illness 91% of the time. Although our specialized professional assessment program was likely to see more serious and advanced pathology, and many of these professionals were found to have sexual disorders, many were found to have undiagnosed chemical dependency or acute psychiatric illness. Most can be helped, and we have seen that it is possible for carefully selected professionals to return to professional life with supervision and under carefully drafted and monitored recovery contracts.

Physicians who engage in professional sexual misconduct are guilty of ethical violation, and some doctors who have committed professional sexual offenses maybe recurrent perpetrators. We can choose to see them as either "sick" or "bad." Through our choice we may drive them toward treatment or toward legal remedy in their attempt to resolve their conflicts. As a profession dedicated to offering help and healing to others, we should extend the same ideals to our peers who have encountered and experienced this occupational hazard whenever possible. Although treatment and therapy are often prolonged, and professional rehabilitation may be possible for only some of these professionals, personal healing and transformation does occur especially when it is supported and encouraged.

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The Impaired Physician and the Role of the Board of Medical Licensure and Discipline

Bruce W. McIntyre, Esq., and Milton W. Hamolsky, MD

Our board struggles to balance "protection of the public" with practitioner due process, privacy, and confidentiality.

The Rhode Island Board of Medical Licensure and Discipline is legally responsible to protect the citizens of the state regarding physician-provided medical care. It attempts to meet its mandate by: 1) ensuring that all physicians practicing in Rhode Island have the appropriate education, training and credentials to be licensed; 2) investigating all complaints and reports alleging unprofessional conduct by a licensed MD or DO (from the public, courts, insurance companies, hospitals, police, other states, etc.); 3) disseminating ultimate findings of unprofessional conduct and the attendant sanction(s) to the public, all health care facilities in the state, the federation of all 50 state boards and the National Practitioner Data Bank.

One major complex and challenging category is the impaired physician. Rhode Island law makes it "unprofessional conduct" for a licensee to be "dependent on controlled substances, incapacitated by use of drugs, habitual drunkenness, and rendering services while intoxicated" (RIGL 5-37-5.1(5)). Impairment also may result from organic or psychological or the ill-defined aging processes.

Anecdotal estimates from other boards indicate that a third to a half of the cases that come before various state boards in any year involve allegations of chemical dependency. Our files reveal a *primary* allegation of alcohol or other drug abuse in 13 of the last 1614 cases opened since our inception in 1987; there is a primary allegation of impairment, *non-substance* abuse in 4 of the last 1614 cases. We appreciate that an "impairment" may be a significant component of other listed primary allegations (such as negligence and abandonment). We believe, however, that our very low incidence is probably not due to a higher rate of temperance in our society (including physicians) but reflects rather a lack of reporting,

an unwillingness of licensees and colleagues to confront this very difficult personal issue by reporting to this board, for any of several understandable reasons.

Our board struggles to balance "protection of the public" with practitioner due process, privacy, and confidentiality. We realize that alcoholism is considered by many to be a disease, and our board considers that each practitioner deserves the opportunity to continue with help to practice or, after help, to return to practice.

We have treated each such case reported to us as we do other types of allegations. After the board determines that the case within our purview and the physician is fully informed, a thorough investigation is conducted by a committee of two physicians and two public members. If the committee's finds no unprofessional conduct, the issues are then independently adjudicated by the other eight members of the board (four other physicians and four other public members). If they concur, the case is closed, all proceedings remain confidential throughout the process and only the complainant and respondent physician are informed of the verdict.

If the initial finding is "unprofessional conduct," the physician is given the opportunity to sign a consent order that states the findings of fact, findings of law and the recommended sanction. If the physician accepts and signs the consent order, the issues are again, and independently, reviewed by the other eight members and then, finally, by the chairperson of the board. Only after this three-stage review and the signed acceptance of the physician are the findings disseminated.

If, however, the physician so elects, an administrative hearing is held as a quasi-judicial process. If, after hearing the case, the hearing committee confirms the unprofessional conduct finding, it will impose a sanction and direct the dissemination. The physician may appeal this decision to the Superior Court.

Except in unusual circumstances, most cases involving physician impairment are referred to the Committee for Physicians' Health of the Rhode Island Medical Society. Each referral is unique and may in-

volve, independently and in total confidentiality by that committee, evaluation, recommendations for management, a contractual arrangement, and may involve monitoring with the referral.

Additionally the board has explored the concept of "diversion." Under this policy, the board may elect not to discipline a physician if he or she cooperates with the treatment plan organized and monitored by the medical society. If the practitioner exhibits successful recovery, the disciplinary file is closed, and no sanction is imposed. However, if the board receives information that the practitioner is not cooperating with the treatment plan, it will take the action appropriate under the circumstances. The board does recognize that "slips" are part of the disease, that not every treatment plan is successful promptly and that there are those few unfortunate individuals who do not respond to treatment. These cases are rare and usually indicate a more serious underlying psychological problem.

Candidates for the pure diversion program are those who admit there may be a problem, are willing to submit to an evaluation, and who are not subject to a corresponding "quality of patient care" complaint. Modified versions of "diversion" sometimes may be appropriate. The physician may be placed on "probation," which will be reportable to appropriate agencies. Probation is a lesser sanction than if the practitioner had elected *not* to seek treatment but to contest the matter.

The diversion concept is controversial. Not every state board goes through the trouble of monitoring compliance with treatment agreements. Many boards simply suspend the licensee and place the burden on the licensee to show, often years later, that he or she is an acceptable candidate for licensure. The continued success of a diversion program in Rhode Island will depend upon the trust established between the Committee for Physicians Health and the board. Both the medical society and the board must have mutual interests, the primary of which

ABBREVIATIONS USED

EAP: Employee Assistance Program
RIGL: Rhode Island General Law

Bruce W. McIntyre, Esquire, is attorney for the Rhode Island Board of Medical Licensure and Discipline. Milton W. Hamolsky, MD, is chief administrative officer for the board, and professor emeritus of medical science, Brown University School of Medicine.

has to be protection of the public. This objective may be accomplished through successful treatment, or, when appropriate, through board action.

Nearly every hospital and health maintenance organization has, or contracts with, an employee assistance program (EAP). The board, at times, employs "the carrot and the stick" approach. Obviously, the EAP is the carrot. In a subtle way the impaired physician is urged by the facility to get treatment or face internal staff privileges restrictions that would be reportable to the board. In these instances, the board may offer a disciplinary diversion program or impose a sanction. This usually prompts the physician to seek treatment.

The board wishes to encourage physicians to intervene by seeking the help of the Physicians' Health Committee. While physicians may be tempted to confront a colleague themselves, those with experience in these matters say that such freelance attempts are of short duration and are usually unavailing. The troubled colleague may rebuke the attempt by the freelancer and leave an unpleasant aftermath. A professional and persistent intervention by members of the committee will ensure that the best possible help offered to the physician.

Treatment needs to be attempted before

patients have been harmed or affected. Once patient care is involved, the prophylactic objective has failed. It is highly unusual that drug and alcohol abuse and impairment reach a patient care level before it is noticed by friends and colleagues. Staying silent is a little like watching an intoxicated friend attempt to leave a gathering behind the wheel of a car and head for the open road. Everyone who silently watched him or her

leave should share some of the eventual moral consequences.

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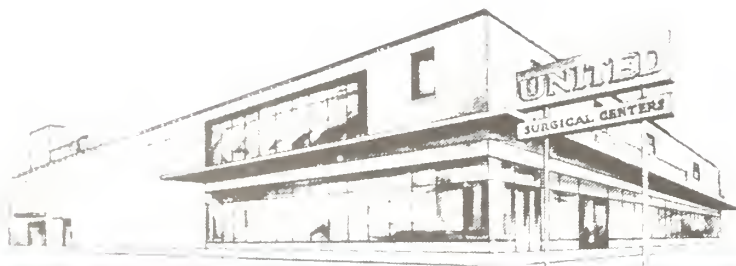
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Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Guidelines for Screening Mammography: The Controversy

Barbara A. DeBuono, MD, MPH, and John P. Fulton, PhD

On Dec. 8, 1993, the National Cancer Institute (NCI) released the following statement:

There is a general consensus among experts that routine screening every 1 to 2 years with mammography and clinical breast examination can reduce breast cancer mortality by about one-third for women ages 50 and over.

Experts do not agree on the role of routine screening mammography for women ages 40 to 49. To date, randomized clinical trials have not shown a statistically significant reduction in mortality for women under the age of 50.

At the same time, the NCI withdrew its standing recommendation for screening mammography every 1 to 2 years among women ages 40 to 49. This position followed the findings of an International Workshop on Breast Cancer Screening, convened by the NCI in February 1993, and is consistent with the positions of the American College of Physicians and the United States Preventive Services Task Force.

In response, the American Cancer Society (ACS) reaffirmed its standing recommendation for screening mammography every 1 to 2 years among women ages 40 to 49. This recommendation had emerged from a consensus conference of 12 major medical organizations sponsored by the American College of Radiology. The American College of Gynecology also reaffirmed the recommendation of the consensus conference.

The result of NCI's statement has been confusion among women ages 40-49 and concern among primary care physicians. The latter must decide to recommend mam-

mography, according to ACS's guidelines, or not, according to NCI's position, almost arbitrarily.

How Did This Happen?

In 1969 Shapiro and Strax demonstrated a 30% decrease in breast cancer mortality among women ages 40 to 64 who received clinical breast examinations and screening mammograms in the HIP trials (Health Insurance Plan of Greater New York). Since then, the effectiveness of screening mammography has been studied with clinical trials, demonstration projects, and by following cancer rates among women ages 40 and over as screening mammography has become more widespread. Periodically, screening experts have assembled to look at screening results and make recommendations for screening content and frequency. Through 1987, when near consensus was reached in the US on breast cancer screening guidelines, cumulative evidence indicated lower mortality among women ages 40-49 who had received screening mammography. In 1992 results of the Canadian trials were published, showing higher mortality among women ages 40-49 who had received screening mammography. Experts reviewing the evidence in 1993 split in their interpretations of the cumulative results available then.

It is important to note that none of the results to date have been statistically significant for women ages 40-49, primarily because none of the studies have been designed with sufficient statistical power to test the effect of screening mammography in this age group. In short, no study enrolled sufficient numbers of women ages 40-49 to

make a definitive statistical statement on this subject. The Canadian study, purportedly focused on women ages 40-49, also suffered from insufficient statistical power.

Why the Controversy?

The experts split in 1993 because they looked at different evidence. Those who formulated the ACS position weighed all available medical evidence. Those who formulated the NCI position restricted themselves to evaluating the results of clinical trials, and insisted that recommendations for the use of screening mammography be based on statistically significant mortality reductions, alone.

The ACS group noted:

- Clinical trials have revealed mortality reductions among women ages 40-49 who have been screened with mammography.
- The Canadian trials, which showed an increase in mortality, suffered from design flaws.
- Even with Canadian trials included, a meta-analysis of all clinical trials to date demonstrates mortality reduction among women ages 40-49.
- The BCDDP, a demonstration project, showed similar survival rates for women ages 40-49, 50-59, and 60-69.
- As screening mammography has become

ABBREVIATIONS USED

ACS: American Cancer Society
BCDDP: Breast Cancer Detection and
Demonstration Project
HIP: Health Insurance Plan of
Greater New York
NCI: National Cancer Institute

more widespread, breast cancer in women ages 40–49 has been found at earlier stages, for which prognosis is excellent. The NCI group noted:

- “To date, randomized clinical trials have not shown a statistically significant reduction in mortality for women under the age of 50.”

Rules of Evidence

“Rules of evidence” are at the heart of the controversy. The ACS has taken a traditional course in evaluating the effectiveness of screening mammography by considering all available evidence. The strength of this position is that *much evidence is available*. Furthermore, as the evidence comes from independent sources, its overall consistency may be weighed to good effect. Many medical technologies in use today have been evaluated in similar fashion. The efficacy of the Pap test, for example, was determined without benefit of clinical trials.

The NCI, on the other hand, has insisted upon one standard for evaluating screening mammography: mortality reduction among women enrolled in clinical trials. The main weakness of this position is that *adequate evidence does not exist from clinical trials to evaluate the effectiveness of screening mammography among women ages 40–49*; it will take years to accumulate. Another weakness of the NCI position is that it was

not taken *a priori*. Even if it makes considerable sense to adopt the clinical trials standard before a technology is widely implemented, does it still make sense to do so after considerable evidence has accumulated that the technology is in fact effective?

Sic Semper

Unfortunately, this is not merely a philosophical controversy, and at present, there are no simple answers. Breast cancer is a deadly disease, and the decision to use screening mammography for women ages 40–49 rests squarely on the primary care physician. As always, physicians must serve their patients in the face of uncertainty.

For the Record

The Rhode Island Department of Health adheres to current ACS guidelines for breast cancer screening in its Women's Cancer Screening Program.

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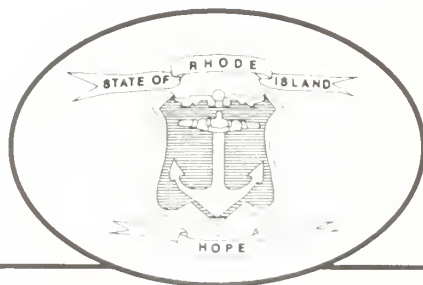
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Diagnosing Breast Cancer at Earlier Stages of Disease

To monitor progress in breast cancer screening according to current American Cancer Society (ACS) guidelines¹ and the related outcome of identifying breast tumors when they are smaller and more curable, the Rhode Island Department of Health analyzed statewide sample survey data from 1987 and 1991 and Rhode Island Cancer Registry data for the period 1987-1991.

Rhode Island women ages 40 and over were contacted randomly by telephone in 1987 and 1991 and asked questions about breast cancer screening. In 1987, 852 women were surveyed (78% response rate); in 1991, 555 were surveyed (65% response rate). The medical records of women newly diagnosed for breast cancer in the period 1987-1991 were abstracted for the Rhode Island Cancer Registry; stage of disease at diagnosis was determined for each reported tumor, using the Summary Staging System of the Surveillance, Epidemiology, and End Results (SEER) program.² Proportions screened for breast cancer with physical breast examination and mammography in 1987 and 1991 were computed and compared with ACS screening guidelines:

Women ages 40-49: Clinical breast exam every year. Mammogram every 1-2 years.

Women ages 50+: Clinical breast exam every year. Mammogram every year.

Proportions of women's breast tumors diagnosed in each of five stages of disease in 1987 and 1991 were computed.

Results

Of women ages 40 and over 37% were screened for breast cancer in 1987, according to current ACS guidelines (Figure 1). By 1991, this proportion had increased to 76%. Between 1987 and 1991, the proportion of women's breast tumors diagnosed in the first two stages of disease increased from 59% to 67% (Figure 2). Among these early tumors, the proportion diagnosed in situ increased from 8% to 13%, and the proportion diagnosed at the local stage in-

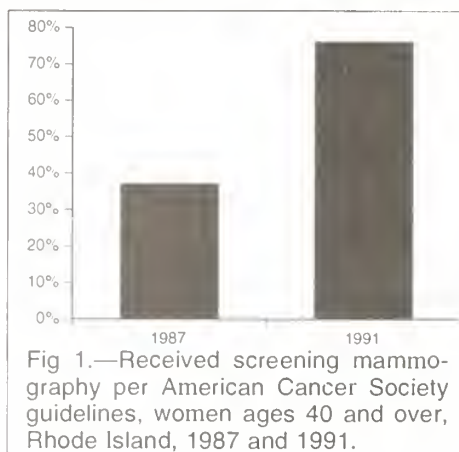


Fig 1.—Received screening mammography per American Cancer Society guidelines, women ages 40 and over, Rhode Island, 1987 and 1991.

creased from 51% to 54%.

Discussion

Significant efforts by Rhode Island's medical and public health communities have achieved a substantial increase in breast cancer screening since 1987. Concomitantly, breast tumors have been diagnosed at earlier stages of disease. The increase in the proportion of tumors diagnosed in situ is especially notable, because these very early tumors can only be detected with screening mammography.

Diagnosing and treating tumors at earlier stages of disease results in greater survival. More women are cured; others live longer and with improved quality of life. Using Rhode Island statistics on stage of disease at

diagnosis and recent stage-specific survival results from the SEER system,² the proportion of women expected to survive 5 years after diagnosis is estimated to have increased from 73% in 1987 to 76% in 1991.

The Rhode Island Governor's Task Force on Year 2000 Health Objectives selected "Increase screening for breast and cervical cancers" as one of 25 priority health objectives for the state. The RI Department of Health is firmly committed to promoting women's cancer screening among women of all income levels. It has consistently fielded state and federally funded women's cancer screening programs since 1987.

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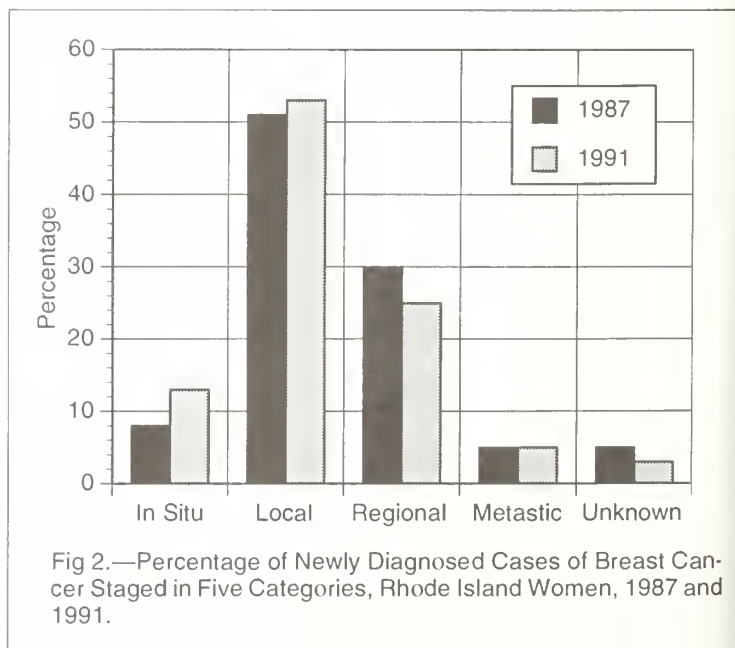


Fig 2.—Percentage of Newly Diagnosed Cases of Breast Cancer Staged in Five Categories, Rhode Island Women, 1987 and 1991.

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (October 1904)

W.F. Morrison, MD, of Providence writes on the harmfulness of over eating. The author observes: "Man eats to live and to gain strength for his daily work. Without sufficient nourishment the machinery of the body cannot run smoothly or with proper efficiency. The excess of food, on the other hand, is just as harmful, involving not only wasteful expenditure but an expenditure of energy on the part of the body which in the long run leads to organic changes in vital organs." He states further: "There are great societies for the encouragement of public sentiment and of legislation opposed to alcoholic intemperance; but how little is said of the intemperance of overeating. The well nigh universal habit of catering to the appetite on all occasions, of bowing to the dictates of the palate even to the extent of satiety and without regard to the physiological needs of the body has resulted in a false standard of living in which we have widely departed from the proper laws of nutrition." He quotes Osler: "Over eating and over drinking are the most frequent causes of disease; the majority of people over 40 years of age habitually eat too much and exercise too little." After lamenting that "... the poor man takes pride in furnishing his family with a diet of rich and expensive articles of food, and imagines that by doing so he is inciting them to greater health and strength," Dr Morrison embarks upon a brief review of the chemistry of foods. He states: "It is easy to see how an excess of proteid food must give rise to a large proportion of nitrogenous waste matter, which if suboxidized, flowing through the system prior to excretion may by acting on the nervous system, or organs of elimination produce the greatest variety of symptoms. The most frequent are called rheumatism, gout, lithemia, oxaluria and various forms of calculi." Still other mani-

festations of over eating, according to this paper, include: amenorrhea and dysmenorrhea, infantile convulsions and constipation. The latter, states the author, results in absorption of ptomaines, languor, dull headaches, loss of memory, and hemorrhoids. He concludes his extensive essay with John Milton's admirable advice: "The rule of not too much by temperance taught / In what thou eat'st and drink'st; seeking from thence / Due nourishment—not gluttonous delight."

Case reports on a gunshot wound of the abdomen and a child with *cancrum oris*, are provided by W.D. Alsever, MD. The first reviewed patient was a 12-year-old school boy who was accidentally shot in the abdomen with a .22 caliber bullet. The child was hospitalized. The white blood cell count was 24,000, his abdomen distended, and X-rays revealed a bullet lodged in the left iliac fossa. A laparotomy disclosed six perforating lacerations of the small bowel. Each was surgically repaired. Recovery was uncomplicated. The second patient was a two and one-half year old male with an alveolar dental abscess, which was cured. About a week later a necrotic area was visible that evolved into large necrotizing ulcer of the mouth. A bacteriological report described organisms resembling those of diphtheria although inoculation into a guinea pig produced no effects. The outcome of this case was not disclosed.

Extra uterine pregnancy is discussed by Joseph C. O'Connell, MD. The author reviews various classifications of ectopic gestation, including Kelly's, which emphasizes the causative role of such preceding lesions as tubal polyps, tubal atresia or maldevelopment, torsion, salpingitis, uterine myomata, peritoneal adhesions, fistulae and twin pregnancy. The author then describes the physical findings in ectopic pregnancy, the symptoms that aid in distinguishing it from other pelvic disorders, and the more prudent forms of surgical intervention. He then gives a detailed description of three

cases, all three undergoing surgery and all recovering.

Charles V. Chapin, MD, superintendent of health, provides a health report for the months of June and July 1904. Tuberculosis and heart disease were the leading causes of death during this interval, but fatal diarrheal diseases were also quite common. (In July, for example, there were 93 deaths attributed to diarrhea.) Diphtheria has been somewhat more prevalent than previous months.

50 Years Ago (October 1944)

Edward S. Emery, Jr, MD, discusses the diagnosis of peptic ulcer in the lead article. The author first lists those disorders (such as gastritis or gall bladder disease) that must be distinguished from peptic ulcer. He then stresses the general epidemiology of peptic ulcer and the role of age, general behavior, and the known or suspected etiological factors. The value of X-ray contrast studies, gastric fluid analysis, and gastroscopy are carefully weighed and discussed. He concludes: "Most patients with peptic ulcer can be easily and reliably diagnosed by roentgen examination. However, there are numerous patients in whom the X-ray cannot be relied upon for a correct diagnosis. The number of these cases is fairly large because other conditions may give symptoms suggesting ulcer and because 3% of ulcer patients fail to show a typical deformity at some time during their disease."

Henry R. Viets, MD, librarian of the Boston Medical Library, discusses medical education—its old purposes and new methods. The influence of Dr Benjamin Waterhouse in the formation of the Harvard medical school is analyzed; the chronology of Brown's first attempts at formal medical education (1811-1826) are carefully reviewed. Finally, the authors note with pleasure that Brown has recently established a

Editorials include a discussion of the state's Cash Sickness Fund; postwar hospital planning; educational programs for practicing (and returning) physicians; and community experiments in tooth decay. (This editorial reviews the clinical trials attempted by New York State in assessing the merit of adding fluorine to the drinking water and determining its effects upon dental caries.) The possibility of a children's hospital in Rhode Island is also considered.

25 Years Ago (October 1969)

Rev. Joseph L. Lennon, of Providence College, discusses some practical implications in the heredity-environment controversy, particularly regarding such elements as intelligence measurement. He concludes that "democracy simply demands that every body be given an opportunity to use such gifts and talents as God has given him. The pseudodemocratic notion that all children should be given the same education is detrimental to the welfare of the larger community, and is harmful to the best interests of the individual."

The second article, written by Christopher Jenks, is entitled, "A Reappraisal of the Most Controversial Document of Our Time." The "controversial document," the so-called Coleman Report, was a lengthy federal inquiry into the possible reasons underlying the substantial disparity in educational accomplishments among the various ethnic groups within the United States. The current article analyzes these educational and noneducational factors that may contribute to this quantitative disparity.

John C. Nemiah, MD, in the fourth annual Burgess Oration, writes on psychiatry in the changing medical curriculum. He states: "With the recent innovations in medical curricula that permit beginning students to see and interview patients and their families, and to observe the role of emotions in the cause and management of illness, the way is now open to achieving that goal. We must be careful not to lose it."

Adjuvant hormonal therapy in breast cancer is discussed by Edward S. Cameron, MD.

Robert V. Lewis, MD, reappraises the life of Leonhard Rauwolf, the great Bavarian physician-botanist born in Bavaria in 1535. (The genus, *Rauwolfia*—from whence the active alkaloid reserpine was derived—had been named in his honor.)

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2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
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2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

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The Elusive Quicksilver

The Greeks called it *argyros chytos* and sometimes *hydrargyros* (from which came the chemical abbreviation, Hg); the Romans called it *argentum vivum*, and its native ore, *minium*. Alchemists, ever seeking connections with the celestial bodies, allied it with the planet Mercury. And we, marvelling at its fluid aliveness, its mercurial spirit, called it quicksilver (*quick*, in its archaic sense of aliveness.)

Mercury rarely occurs naturally in its elemental, liquid form. Most commonly it exists as a pigmented, powdery mineral such as cinnabar, hermisite or coccinite. Only cinnabar (mercuric sulfide), however, is commercially exploited. Cinnabar was valued in prehistory first as a scarlet coloring and cosmetic agent. It was employed, for example, in the surface designs of many prehistoric relics. Ancient tattooing, a process forbidden in the Scriptures (Leviticus 19:28), used cinnabar as its principal pigment. Chinese stamp ink consisted of a mixture of cinnabar and oils. The forehead spot of red used by many Hindus was classically a smudge of cinnabar. The Romans called this pigment vermilion. Monks used it to illuminate the exquisitely detailed lettering of their medieval manuscripts, a process called miniating (from the Latin name for cinnabar, *minium*). The word "miniature," meaning anything small and detailed, derives from this.

Most Mediterranean cultures had discovered two special properties of mercury and its ores. First, that cinnabar yields elemental mercury when heated above 357° Centigrade, a process called sublimation. And second, that mercury binds, or amalgamates, with gold or silver thus effectively separating these precious metals from their native ores and other contaminants. Heating the resulting amalgam volatilized the mercury, thus isolating

essentially pure gold or silver. Mercury mines therefore became valuable properties expressly for their role in the processing of precious metals. The world's largest at Sisapo, Spain, was conquered by the Romans during the Punic Wars and then expanded considerably. To this day these Spanish mines, now called Almaden, produce more than 15% of current world needs. Productive cinnabar-mercury mines were also operated in Slovenia, pre-Columbian Peru, Mexico, and California. Mercury is not mentioned in the Bible except tangentially. The ancient Hittite town of Iconium was the site of a cinnabar mine. And when Paul, in his travels, visited this community the local citizens referred to him as Mercurius (Acts 14:12).

The capacity of mercury to chelate metals other than gold and silver, thus facilitating their isolation, made it invaluable to the early alchemists and analytic chemists. Mercury was so indispensable to alchemists that their activities were often called the hermetic arts, after Hermes, the Greek equivalent of the god Mercury.

Mercury was critical to the experimental efforts of Hales, Cavendish, Boyle, Lavoisier, Ohm and Faraday. Sublimation of mercuric oxide, by Priestley, led to his discovery of oxygen. Torricelli's invention of the barometer required quicksilver, as did the fabrication of thermometers, hypometers, sphygmomanometers, seismoscopes and vacuum pumps. To demonstrate the ramifications of the lymphatic system, Virchow had injected mercuric pigments into experimental animals. Mercury products are still essential in mercury vapor lamps, batteries, switches, relays, anti-fouling maritime paints, and agricultural herbicides and fungicides.

Mercury, like arsenic, has been a two-edged sword: capable of yielding some noteworthy medications, yet more often responsible for a range of morbidities.

The toxic effects of mercurial vapor—generated in the smelting process after amalgamation—were quickly perceived, even in antiquity. In the 13th century, Bartholomaeus Anglicus writes: "The smoke thereof is most grievous to men. For it breedeth the palsy and quaking, shaking, neshing of the sinews." This text also observes that swallowing pure mercury is not toxic, while inhaling its vapors clearly is. Furthermore, says Bartholomaeus—shades of Hamlet—mercury is quite toxic when placed in the external ear canal.

Hippocratic writings make little mention of mercury except to warn of its fumes. There is no evidence that Galen employed any mercurial therapies. Rhazes and Avicenna describe the tremors, blindness, foul breath and weakness incident to mercurial exposure, but it was not until the 10th century that mercuric ointments were advised for skin ailments and particularly for head lice. John XXI, before his elevation as the 187th pope, had been professor of medicine at Siena, authoring *Thesaurus Pauperum*, a small compendium of prescriptions, many incorporating mercurial compounds.

The Huguenots manufactured hats using felt of animal hair origin, a major 17th century industry in France. Their forced migration, largely to England, was responsible for the transfer of this specialized industry, with its many procedural secrets, to the English midlands. One of these secrets involved the use of a mercuric nitrate solution to produce a more pleasing felt surface. Hat workers chronic exposed to this solution, however, were frequent victims of dementia; or, in common parlance, mad as a hatter.

Two distinguishable chlorides of mercury had been identified by alchemists. The mercuric salt (corrosive sublimate) was uniformly toxic; the mercurous salt (called calomel or *mercurius dulcis*) was far less toxic and was occasionally pre-

scribed as a cathartic, a diuretic and sometimes for leprosy. With the calamitous introduction of syphilis into 15th century Europe, a disease with no available remedies, medicine's limited pharmacopia was desperately explored—and mercury was chosen. Exposure of the skin to its vapors (called fumigation) and rubbing of the skin with its ointments (called friction or inunction) became the principal antiluetic therapies of the late renaissance. The process consisted of placing one or more patients into a large wooden tub, exposing them to mercuric vapors while they rubbed each other's backs with mercurial compounds. Historians say that the Mother Goose couplet: *rub-a-dub, three men in a tub*, represents an allusion to this common practice. However, since most cases of primary syphilis resolve spontaneously, the mercurial therapy went unchallenged until it was finally supplanted by bismuth and the organic arsenicals some 3 centuries later. The first credible doubts of the efficacy of mercurials as antiluetic agents arose with the 1812 studies of William Fergusson, a senior British army physician then stationed in Portugal. Fergusson compared the long-term outcomes of Portuguese soldiers with syphilis (receiving no treatment) and British soldiers (receiving the standard mercurial therapy). The outcomes, in terms of secondary and tertiary luetic manifestations, were the same, and the merit of mercury was thus cast into grave doubt.

By the 19th century antiseptic ointments were devised and mercuric bichloride solution was adopted as a disinfectant. Soaps incorporating mercuric salts were widely applied by dark-skinned persons to lessen surface pigment. In the current century, a disodium mercuric salt of dibromofluorescein (commercially called mercurochrome) replaced iodine solutions in preparing the skin for surgery. Metaphen and merthiolate represented further improvements on this product. Phenyl mercuric acetates have also been incorporated in spermicidal jellies. Mercuric diuretics (mercupurine, mercurhydrine) were used routinely until the advent of the carbonic anhydrase inhibiting thiazides.

Methyl mercury is a byproduct of many industrial processes. In Minamata Bay, Japan, the food-chain became contaminated with organic mercurials and consumption of local fish caused a syndrome including ascending paralysis and teratogenesis (Minamata disease) in over 4,000 Japanese; a similar tragedy in Iraq showed the need for a more rigorous environmental surveillance of the toxic metals.

Most dental cavities are filled with an amalgam of mercury and powdered silver. The mercury concentrations in the urines of dentists, on average, are elevated although no excess of mercurialism is found either in dentists or their technicians. Nor has any linkage been determined between amalgam-filled cavities and subsequent neurologic disease. However, the temperature needed to cremate bodies will vaporize the mercury in the body's dental fillings, thus liberating mercurial fumes; this now represents a major source of atmospheric mercury.

The advent of syphilis in the 15th century transformed mercury from a bit player—providing modest salves for ill-defined skin affections—to a major medicinal on the therapeutic stage. Indeed, by the 18th century, mercury was the leading empiric agent said to cure an imposing spectrum of man's ills. Ultimately all were shown to be uniformly ineffectual. During this interval of medicine's adolescence, happy anecdotes and breathless enthusiasms took the place of reasoned skepticism and clinical trials. Only the organic mercurial antiseptics and diuretics, 20th century achievements, have saved mercury from total ignominy.

Stanley M. Aronson, MD

The Stone Age of Measurement

Hardly a single British novel of the 19th century failed to employ a colorful but utterly perplexing body-weight system. This bit of Albion eccentricity went something like this: "Percival's cousin, twice removed, was a ruddy-faced, robust squire of 13 stone, 8 pounds." The pounds part of this expression is self-evident; it is the stone part that baffles. Why use an archaic, capriciously indeterminate system of stone-weight when the pound-ounce measurement is substantially more reliable and certainly better understood? And why, indeed, even use the pound-ounce system when most every nation now describes its males, robust or otherwise, with the simpler metric system? Incidentally, since one stone equals 14 pounds, Percival's cousin therefore weighed 190 pounds (86.1 kilograms). The categories of competitive boxing in England (eg, heavyweight, lightweight, etc) are still defined by stone and pounds, one of the few enterprises where this system persists. The stone, moreover, is not exactly a stable weight when weighing things other than humans: with fish, it is generally 8 lbs; with wool, 16 lbs; with

lambs, 24 lbs; and in rural Germany, then called *der Stein*, it is 22 lbs.

For more than 4 millenia the world has struggled to find ways of better expressing the gravitational pull on mass (sometimes called weight). Measurement systems have succeeded measurement systems each seeking standards that are simpler to transpose, less arbitrary and based more upon independently verifiable values. But certain English-speaking nations, reflecting a marriage of nostalgia, insularity and laziness, are steadfast in still employing the archaic pound unit as their primary quantification of weight. The word, pound, originates in the Latin phrase *libra pondo* (a unit of weight). The sense of "gravity" in the Latin *pondo* persists in such current words as ponderous and imponderable. *Libra* is the Latin word for scale or balance (as in the zodiacal constellation, Libra). The sense of balance persists in such words as equilibrium and deliberate. The *fibra* represented the fundamental unit of Roman weight and weighed about a pound. The word was altered somewhat to its medieval French equivalent, *livre*, which, in pre-metric France was equal to 489.5 grams or approximately an avoirdupois pound. The curious abbreviation for pound (lb.) is nothing more than a shortening of the word *libra*. The pound, as a measure of British currency, derives from its guaranteed worth equal to the value of a pound of sterling silver (the word sterling is probably from an older Frankish name, *esterling*, a small silver coin with an impressed star design.) The quaintly gothic symbol for the British pound (£), also represents an abbreviation of *libra*. And while the pound, as a measurement of weight, is a substantial improvement over the stone, it nevertheless requires the mathematical skills of a rocket scientist or an idiot savant to manipulate or convert it to other systems. There are, of course, not one but three sanctioned pounds: the avoirdupois pound, legitimized in England by King Edward III and defined as equal to 16 ounces or 7,000 grains, or by current standards, 453.59 grams. There is the troy pound equal to 12 ounces, or 5,760 grains, or 373.24 grams. And then there is the apothecary pound equal to 96 drachms, or 288 scruples.

The metric system, one of the more enduring contributions of the French Revolution, was established in the winter of 1799. Its designers chose the Greek word *metron*, meaning a measuring rod, to give title to the system. The statutory unit of weight, the kilogram, is still maintained as a platinum bar in the vaults of the

International Bureau of Weights and Measures, Sèvres, France. It remains the only tangible standard of the metric system; all the other standards are now defined by astrophysical or electronic criteria. The statutory length, the meter, initially existed as the distance between two scratched lines on a bar of platinum (representing one-ten millionth of the quadrant arc between the North Pole and the Equator). In 1960 this was changed to 1,650,763.73 wavelengths of orange-red light emitted by the radio-active isotope krypton-63. In 1980 the definition of the meter was further refined to the distance that light travels in 1/(299,792,459) seconds.

Within recent decades the international scientific community has supplanted the metric system with a yet newer system employing SI Units (Système Internationale d'Unités) maintaining, however, most of the metric nomenclature and standards. The seven basic units of the SI System are: meter (length), kilogram (mass), second (time), kelvin (temperature), ampère (electrical current), mole (quantity of substance), and candela (luminous intensity). From these defined constants, 18 secondary units are derived: becquerel, coulomb, farad, grey, henry, hertz, joule, lumen, lux, newton, ohm, pascal, siemens, sievier, tesla, volt, watt and weber.

Virtually every culture capable of sustaining itself and developing some elements of commerce have fashioned a weights and measures system. The isolation of one peoples from others had helped to perpetuate these indigenous systems but as national boundaries became more porous and the market place assumed global proportions, standardization of weights and measures became economically essential. The vestiges of many of these discarded weights and measures nevertheless persist in remote villages and in the minds of those who design crossword puzzles. Occasionally, a nation may preserve an archaic name by redefining it in compliance with some more modern system of standards. In ancient Egypt, for example, the Greek coin, the *drachma*, was transformed into a unit of weight, the *dirhem* (about 3.12 grams). The word has been modified over the centuries to become the *dram* of the troy system of weights. (A dram = 3 scruples = 60 grains = 3.89 grams.) The word, gram, on the other hand, was chosen by the French scientists as the root word for metric

weight. In Greek, *gramma* means "that which is written." As a suffix, it appears in such words as telegram.

In classical Israel, the smallest unit of weight was the *bekah* (4.2 grams). (120 bekahs = 60 shekels = 1 minah.) In the Far East, the Chinese absorbed a Sanskrit word *tael* and defined it as their basic unit of weight. It is equal to about 1.3 ounces (37.8 grams). The Chinese system of *taels* and *chins* was accepted by Spanish and Portuguese traders in the 17th century and disseminated secondarily to such places as Indonesia and Korea.

The Roman *quintal* (and later, the Arabic *qintar* and the medieval *quintale*) denoted a weight of about 112 pounds (8 stone or 45.4 kilograms). Today, in most countries, the *quintal* is made the equivalent of the *centner*, or 100 pounds. In western Europe, the *mark* defined both coinage and a system of weights, particularly for precious metals (equal to about 244.8 grams.) Readers of the Robin Hood legend will remember that King Richard's ransom was paid in marks. In eastern Europe, such vestigial weights as the Bulgarian *tovar* (282.6 lbs.) and the Russian *zolotnik* (about 0.15 oz.) are still encountered in smaller communities.

Some systems of weight or volume were employed in narrow settings such as the measurement of precious jewels, or wool, or fish, or wines and other spirits. (Wine lovers might rebel if a magnum or

a jeroboam defined anything but the volume of their wine bottles.) An old English measure of fluid weight (particularly ale) was the *firkin*, defined as the weight of a fourth of a barrel of beer. The word comes from the Old English *vierde* (a fourth) and the diminutive suffix *-kin* (as in mannikin or munchkin.)

Each system of weights—chins, ounces, tovars, qintars and a thousand others—represents the collective efforts of many seeking to standardize measurement beyond their village, to replace anarchy with a verifiable commercial system such that a pound of peppers in a Punjab commune today is as heavy as a pound of peppers in Pretoria tomorrow. In the market place, a reliable weight-system allows cautious trust to replace paranoia. In the arena of science, it offers a common language which encourages the flow of verifiable information. Only in the realm of literature does there seem to be virtue in clinging resolutely to the scales of yesterday. Percival's robust cousin stands more boldly, seems more substantial, in his sturdy 13 stone, 8 pounds. Were he merely described as weighing 190 pounds, ruddy or not, he would have lost some intangible element that had identified him as rural English gentry; and if he were said to weigh 86.1 kilos, he could be just about anybody.

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Prevalence of Positive Urine Drug Screens in a Prenatal Clinic: Correlation with Patients' Self-Report of Drug Use

Kerri Ashling, BS, MS, MD, Arthur H. Gross, MD,
Daniel T. Coghlin, BA, Patrick J. Sweeney, MD, PhD

When urine toxicology screens were compared to self-reported substance abuse, it was found that only 15 (33%) of the 45 toxicology-positive women admitted to current or past abuse of drugs or alcohol.

Increasing public concern over illicit drug use during pregnancy has led many state legislatures to adopt or consider laws protecting the unborn fetus from maternal substance abuse. Many studies have linked substance use during pregnancy to adverse perinatal and neonatal outcomes such as premature delivery, abruptio placentae, low birthweight, small head circumference, congenital anomalies, neonatal withdrawal, apnea and neurobehavioral deficits.¹⁻⁹

While these outcomes cannot be attributed solely to illicit drug use, such reports pose difficult questions for legislators, public health planners and physicians. Studies also have found that drug and alcohol use by pregnant women has been increasing in recent years.^{5,10} The prevalence of substance abuse in the obstetric population has reached alarming proportions in many urban and rural areas.^{1,2,4,10-16} A 1989 Rhode Island Department of Health study found a 7.5% positive rate for illicit drug use among women admitted in labor to Rhode Island hospitals.¹⁷ Women who delivered at Women and Infants Hospital had an overall positive rate of 8.9% and were significantly more likely to be positive for cocaine. However, since the urine drug screen was only able to detect use within the previous 48 hours, these prevalence rates did not include women

who were sporadic "recreational" users, or women who may have used drugs during the early developmental stages of pregnancy and then stopped before labor.

The purpose of our study was to determine the prevalence of illicit drug use during early pregnancy in our predominantly urban, low income population and to test the reliability of self-reported drug use.

Materials and Methods

This investigation was conducted from March 2 through July 20, 1992. The protocol was approved by the institutional review board before the start date. The study population included all women presenting to Women and Infants' Hospital Prenatal Clinic for a first prenatal visit. Information on maternal age, race, gravidity, parity, estimated week of gestation and past or present drug use was collected by clinic nursing staff during routine prenatal intake interviews and then entered onto a numerically labeled data form designed for this study.

Table 1.—Results of 45 positive urine toxicology screens

Substance	N	(%)
Cannabinoids	20	(44.4)
Cocaine	19	(42.2)
Barbiturates	6	(13.3)
Opiates	5	(11.1)
Amphetamines	1	(2.2)
Multiple Drugs	6	(13.3)

Routine urine samples were collected from each woman and divided into two containers by the patient. The extra container was labeled with the project billing number and a data form number, and then sent to the hospital laboratory for analysis. Informed consent was not necessary since neither the data forms nor the samples were labeled with any identifying information, guaranteeing patient anonymity. Urine samples were screened for amphetamines, barbiturates, opiates, cocaine and its metabolites, phencyclidine and cannabinoids using the SYVA EMIT II toxicologic assay kit (SYVA Company, Palo Alto, Calif). The cutoff concentration for barbiturate was 200 ng/ml, for cannabinoids 100 ng/ml, for cocaine

metabolite (benzoylecgonine) and opiates 300 ng/ml, for phencyclidine 25 ng/ml and for amphetamine 1000 ng/ml.

During the study period, 530 urine samples were obtained. Fifteen of these were unable to be used for some of the calculations due to missing data forms; however, none of the 15 had positive screens.

Continuous data for the toxicology screen positive and negative groups were compared using an unpaired *t* test. Categorical values were compared using a chi square test with continuity correction. Associations were tested using Phi coefficient for two-by-two tables and Cramer's V coefficients for larger tables. Results were considered statistically significant for values of $P < 0.05$. Odds ratios were calculated for some comparisons.

Results

Of the 530 urine samples collected and analyzed, 45 (8.5%) had a positive urine toxicology screen. Table 1 lists the positives reported for each substance. Twenty (44.4%) were positive for cannabinoids, and 19 (42.2%) for cocaine, with barbiturates, opiates, and amphetamines being less prevalent. Six samples (13.3%) were positive for more than one drug, five representing combined use of cocaine and cannabinoids and one cocaine and opiates.

When urine toxicology screens were compared to self-reported substance abuse it was found that only 15 (33.3%) of the 45 toxicology positive women admitted to current or past abuse of drugs or alcohol. Seven of the women who did admit substance abuse either reported having quit using or did not admit use of the specific drug for which they tested positive. Another 30 women admitted past or present substance abuse but were found to be negative on toxicology screen.

Comparing the 509 women on whom we had ethnicity data, we found a significant difference in ethnic origin between those who were toxicology positive and negative

ABBREVIATIONS USED

CSAP: Center for Substance Abuse Prevention

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Table 2.—Comparison of urine toxicology results by ethnic origin

	Black (N=109)		White (N=276)		Hispanic (N=97)		Other (N=27)		Total (N=509)
	N	(%)	N	(%)	N	(%)	N	(%)	N
Positive screen*	17	(15.6)	20	(7.3)	6	(6.2)	0		43
Negative screen	92	(84.4)	256	(92.8)	91	(93.8)	27	(100)	466
Cocaine positive**	9	(8.3)**	5	(1.8)	4	(4.1)	0		18
Cocaine negative	100	(91.7)	271	(98.2)	93	(95.9)	27	(100)	
Cannabinoid positive	7	(6.4)	12	(4.4)	0		0		19
Cannabinoid negative	102	(93.6)	264	(95.7)	97	(100)	27	(100)	

* $P < 0.05$ when compared to negative screens

** $P < 0.05$ when compared to negative screens

(Table 2). Women from "other" ethnic groups, including Asian, Native American, Cape Verdean, or "other" did not have any positive screens in our study. Black women were more likely to have a positive screen (15.6%) than white (7.3%) or Hispanic (6.2%) women ($p < 0.05$). Calculation of odds ratios revealed that blacks were 2.4 times more likely than whites and 2.8 times more likely than Hispanics to test positive. No statistical conclusions could be drawn regarding barbiturate and opiate use among ethnic groups because the numbers were too small for analysis ($n=6$ and 5 , respectively).

Studies . . . found that drug and alcohol use by pregnant women has been increasing in recent years.

When toxicology screens for cocaine alone were examined, again there was a significant ethnic difference between women screening positive and negative ($P < 0.05$). Blacks were significantly more likely to use cocaine than whites, with Hispanics intermediate between blacks and whites (Table 2). Calculation of odds ratios showed blacks tested positive 4.9 times more than whites and 2.1 times more than Hispanics, while Hispanics were positive 2.3 times more than whites. It must be cautioned, however, that the association between ethnic origin and urine toxicology results was rather weak. Cramer's V coefficient for the association between ethnic origin and any positive screen was only 0.15, and the coefficient for the association between ethnic origin and a cocaine positive screen was 0.14. The relationship between ethnic origin and a cannabinoid positive screen was not found to be statistically significant.

Demographic data were also compared for women with positive and negative toxicology results (Table 3). Women with positive test results were significantly older ($P < 0.05$) and had higher gravidity ($P < 0.001$) and parity ($P < 0.001$). Only 6 of 190 primi-

parous women (3.2%) tested positive on toxicology screen, whereas 38 of 318 multiparous women (12%) tested positive, a statistically significant difference. The Phi coefficient for this association was 0.0012, indicating a very weak association. Of special note is that there was no significant difference in gestational age at first prenatal visit for women with positive and negative screens (Table 3).

Discussion

Drug abuse patterns during pregnancy vary according to geographic location and population examined. Our study found an overall positive rate of 8.5% on 530 consecutive urine toxicology screens of women presenting for their first prenatal clinic visit. This rate is almost identical to the prevalence of drug use found by an earlier Rhode Island statewide survey of women admitted in labor.¹⁷ This suggests the possibility that the pattern of substance abuse in Rhode Island remains fairly stable throughout pregnancy. Such a conclusion would be consistent with the findings of Little et al that among 53 self-reported substance abusers, all of whom used drugs during the first trimester, 77% continued using illicit substances throughout pregnancy.³ Frank et al also found that more than half of pregnant cocaine users took the drug at least once a week while pregnant.¹⁶

Our results almost certainly underestimate the actual prevalence of illicit drug use by pregnant women. A degree of self-selection bias must be assumed since all of our subjects had registered for prenatal care;

other studies have reported that substance abusers are more likely to have little or no prenatal care.^{3,14,15} Urine toxicology screens are limited in that they can only detect substances within several hours to a few days of when they were taken. Drug users who do seek prenatal care may abstain before appointments if they suspect they will be tested. Many others, especially less frequent users, may simply be missed by the short "window" that the urine toxicology test affords.

Our finding that blacks were significantly more likely to have positive urine toxicology results, particularly for cocaine, is consistent with reports of other investigators.^{3,10,15} However, this was not a strong association in our study. Chasnoff et al¹² found that while blacks were more likely to use cocaine and whites were more likely to use marijuana, there was no significant difference in the overall rate of positive toxicology screens between the two groups. The investigators cautioned against assuming that substance abuse by pregnant women is a problem of urban, low-income minorities. Based on the results of our study, we also feel that ethnic origin is not a reliable indicator of women at risk for using drugs.

Women with positive test results were significantly older and had higher gravidity and parity.

The substance abusers in our sample were significantly older, with higher mean gravidity and parity than non-users. Multiparity was strongly associated with a positive toxicology screen. Increased age,^{2,4,14} gravidity^{2,4,14} and parity^{2,14} of drug users when compared to non-users have been demonstrated in other studies, but such differences are often dependent upon the substance being used and the population under examination. The disparity in gravidity found in our study may simply be due to the older age of the toxicology positive women since age was not controlled.

Interestingly, there was no difference in gestational age at first prenatal visit between toxicology positive and negative women. Since it has been well documented

Table 3.—Comparison of demographic characteristics of women with positive and negative urine toxicology screens

Characteristic	Positive Screen Mean \pm SD (N)	Negative Screen Mean \pm SD (N)	Significance
Age	25.8 \pm 5.4 (44)	23.8 \pm 5.8 (470)	$P < 0.05$
Gravidity	3.7 \pm 1.7 (43)	2.7 \pm 1.8 (462)	$P < 0.001$
Parity	2.1 \pm 1.5 (43)	1.1 \pm 1.4 (463)	$P < 0.001$
Gestational age at first visit	16.3 \pm 6.5 (41)	17.7 \pm 7.7 (447)	NS

that substance abusers often do not seek prenatal care at all,^{4,14,15} our study population very likely represents a special subset of pregnant substance abusers—possibly related to their higher parity and previous pregnancy experiences. Our self-selected sample of drug users either understood the general benefits of prenatal care or sought specific drug treatment intervention. Alternatively, they could have been less heavily involved in substance abusing behaviors and thus have less chaotic lifestyles than those who do not seek prenatal care.

... studies have reported that substance abusers are more likely to have little or no prenatal care.

Although the specific adverse neonatal outcomes associated with drug use during pregnancy continue to be defined and researched,^{18,19} physicians and health care providers should be advocates for prevention and treatment programs. All pregnant women should be asked about their use of drugs and alcohol; those who admit to abuse should be informed of the potential detrimental effects on their health and the health of their babies and should be encouraged to seek appropriate treatment. Other factors that have been shown to be associated with poor outcomes, such as alcohol and tobacco use, inadequate nutrition, low socioeconomic status, lack of prenatal care and poor reproductive history, have also been associated with substance abuse.^{4,10,14-16} Timely detection of drug use during pregnancy not only maximizes the potential for encouraging women to enter drug treatment programs, but also facilitates early intervention to address the other risk factors associated with poor pregnancy outcome. Our data, in agreement with other studies,^{1,2,4,15,16} indicate that drug history alone fails to identify many women using drugs. Two-thirds of women who had positive urine screens denied any past or present drug use. Routine urine toxicology screening of all prenatal patients would undoubtedly identify many more—but not all—substance abusers. However, in addition to the inherent legal questions such routine testing inevitably raises regarding confidentiality and patients' rights, we feel that the greatest danger of such an action is the fear that toxicology information will be used in a punitive manner, thus deterring pregnant substance abusers from seeking prenatal care at all.

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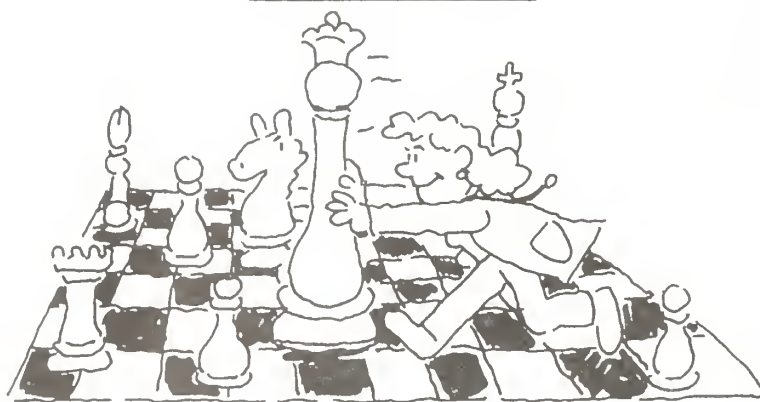
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Evolving Standards of Practice for Clinical Cytogenetics

Hon Fong L. Mark, PhD, FACMG, and
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With the establishment of the American College of Medical Genetics and specific committees to oversee the quality control and quality assurance issues of genetics laboratories, the delivery of cytogenetic services will continue to improve.

The subspecialty of clinical cytogenetics has been closely scrutinized over the years. Certain minimum criteria are mandated by agencies such as the College of American Pathologists (CAP), the Food and Drug Administration (FDA), the Health Care Financing Administration (HCFA), federal regulations such as the Clinical Laboratory Improvement Amendments (CLIA) of 1988 and, at the state level, the RI State Licensure Requirements of Clinical Laboratory Science Practitioners (R23-163-LL5).

With the recent recognition of the American Board of Medical Genetics (ABMG) as the 24th primary specialty board of the American Board of Medical Specialties (ABMS), the professional organizations representing medical geneticists have been restructured into a tripartite structure characteristic of most medical specialties. The American Board of Medical Genetics (ABMG) is the accreditation body for training programs and the certification board for medical geneticists. The American College of Medical Genetics (ACMG), founded in 1991, is the standards and practices arm of the medical genetics community while the parent organization, the American Society of Human Genetics (ASHG), is now the scientific research arm of the field. In recognition of the broad implications for genetic testing and the critical need for high standards and self-regulation, and in col-

laboration with other genetics organizations (eg, Association for Cytogenetic Technologists, regional genetics networks and the College of American Pathologists), the ACMG in 1991 initiated efforts to update and broaden the standards and guidelines for the practices of clinical cytogenetics, clinical biochemical genetics and clinical molecular genetics. On March 21, the ACMG endorsed the *Standards and Guidelines: Clinical Genetic Laboratories*, circulated copies to all ACMG fellows of the ACMG, and made them available for purchase by non-members. This publication, representing the only current consensus of medical geneticists on standards of practice for laboratory genetics, consists of the following major subsections: overview, personnel policies, general policies, shared methodologies, clinical cytogenetics, clinical biochemical genetics and clinical molecular genetics. These sections, representing the only official source of information and guidance currently available for genetic testing laboratories, are described below.

Overview

This section states the purpose of the standards: the promotion of accurate and reliable diagnostic genetic laboratory testing. These standards are minimal criteria recommended for clinical genetics laboratories, beyond which all laboratories should continue to strive to achieve excellence. They include standards that medical geneticists consider to be required as well as recommendations of goals beyond the minimal requirements.

Personnel Policies

Personnel policies for the genetics laboratories include details about the qualifications of a laboratory director and/or laboratory technical supervisor. Basically, the requirement for personnel qualifications for laboratory director is consistent with that of CLIA '88. The laboratory director is required to have an appropriate doctoral degree and at least 2 years of postdoctoral

training or experience in a particular clinical laboratory subspecialty, as demonstrated by prior experience and as detailed in the resume of the director. In addition, it is the position of medical geneticists that the individual be eligible for American Board of Medical Genetics certification, which is by written examination. Eligibility for the examination, which is given every 3 years, expires after two cycles and reapplication is required after expiration of eligibility, usually due to failure to pass the board certification exam. Under the CLIA '88 regulation, a clinical consultant is required for all laboratories, a role most appropriately served by an ABMG-certified individual, usually the laboratory director. Medical geneticists consider the need for appropriate training in human and medical genetics to be critical for ensuring the accuracy of the interpretive component of testing. This aspect of testing is unique to medical genetics in which test

ABBREVIATIONS USED

ABMG: American Board of Medical Genetics
ABMS: American Board of Medical Specialties
ACMG: American College of Medical Genetics
ASHG: American Society of Human Genetics
CALGB: Cancer and Leukemia Group B
CAP: College of American Pathologists
CLIA '88: Clinical Laboratory Improvement Amendments of 1988
CVS: chorionic villus sampling
FDA: Food and Drug Administration
FISH: Fluorescent in situ hybridization
HCFA: Health Care Financing Administration
ISCN: International System for Human Cytogenetic Nomenclature
NERGG: New England Regional Genetics Group
PUBS: percutaneous umbilical blood sampling

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results have implications for entire families and not just the individual undergoing testing. The need for such specialty training is further demonstrated by the lack of human genetics training in other laboratory specialties. In fact, as of 1985, fewer than half of all US medical schools included significant teaching of human genetics in their curricula. In addition, several other functions and requirements for the laboratory director are spelled out in this section. These qualifications apply equally to cytogenetics, biochemical and molecular genetics laboratories.

A general laboratory supervisor also must meet certain minimal standards. The general supervisor must have a minimum of 3 years of experience in a subspecialty under the supervision of a qualified laboratory director. Certification by a national testing agency is recommended.

For a clinical laboratory technologist/technician, an undergraduate degree in a life science or 5 years of relevant laboratory experience is required. For each cytogenetics laboratory, it is recommended that there be at least one full-time technologist in the laboratory who is certified in cytogenetics by a recognized national certification body. Certification should be pursued by all technologists/technicians and current certification should be maintained by reexamination or by continuing education units.

As mentioned previously, a clinical consultant must be ABMG-certified. Again, this role can be fulfilled by a laboratory director, if the laboratory director is ABMG-certified. Currently, only a few hundred board certified cytogeneticists are available to direct cytogenetics laboratories. About 1,000 fellows of the American College of Medical Genetics are found worldwide.

General Policies

Requirements regarding space, equipment, facilities and supplies are discussed in detail. Safety requirements are also emphasized. It is further stated that a laboratory is required to participate in a mandated laboratory inspection, as required by state or federal regulations. The guidelines state that a laboratory may engage the services of another laboratory to provide a service in the event that test systems are not available in the primary laboratory or to divert excess volume. In this event, however, the guidelines state that the subcontracting laboratory must also meet all applicable guidelines and standards stated in this document, as well as those of CLIA '88 and HCFA. The identity of any subcontracting laboratory in

that portion of the study for which it is responsible must be clearly noted on the report.

Miscellaneous Items

The integrity of patient records and patient confidentiality is emphasized. To preserve confidentiality, the guidelines state that records should be released only after appropriate authorization.

Quality Control/Assurance/Improvement

The guidelines state that the laboratory must participate in at least one external proficiency testing program, evaluating its subspecialty, if available. Also addressed are certain issues concerning commercial kits. Other issues such as procedure manuals and also the use of accepted nomenclature are mentioned. Lastly, the levels of development of diagnostic tests are discussed. The guidelines state that studies conducted at the investigational level must be stated as such.

Shared Methodologies

This section discusses biosafety containment cabinets, incubators, etc. Under the clinical cytogenetics section, the multiple aspects of cytogenetics testing are examined in detail. Items such as records, the banding level, chromosome counts, cell analysis, cell scoring, definition of a colony in a clone, various kinds of banding, use of an International System for Cytogenetic Nomenclature (ISCN 1985, 1991) and many other details are given. This section also discusses various tissues that can be analyzed (ie, amniotic fluid samples, chorionic villus sampling (CVS), percutaneous umbilical blood sampling (PUBS), peripheral blood samples, bone marrow samples as well as solid tumors). Critical issues such as the number of cells counted and aspects of analysis and interpretation are discussed in detail under this section. All reports of genetic testing should be written in a format that is clearly understood by a nongeneticist physician. Lastly, only individuals qualified as a laboratory director shall sign final reports.

Clinical Biochemical Genetics/ Clinical Molecular Genetics

A discussion of these two subspecialties is beyond the scope of the present article except that it is not uncommon to find clinical molecular genetics programs within the organization of the clinical cytogenetics laboratories. In this connection, it

should be mentioned that for molecular cytogenetic testing, it is especially important to remember that a qualifying statement must indicate that the results are based on an investigational technique in contrast to standard cytogenetic testing based on established banding techniques, as commercially available DNA probes employed for FISH are not yet FDA-approved for diagnostic purposes as of July 1994.

Conclusion

With the establishment of the American College of Medical Genetics and specific committees to oversee the quality control and quality assurance issues of genetics laboratories, the delivery of cytogenetic services will continue to improve. Of critical importance will be the need to establish standards of practice and to keep abreast of this rapidly developing area of laboratory testing. The Quality Assurance Committee of the ACMG is charged with this responsibility and welcomes comments from other practitioners or users of these services. These are all positive changes requiring increased commitment in effort on the part of health care providers, no doubt. They also represent an improved attitude and a better way of doing business, a challenge brought on by health care reform that all of us must strive to meet.

For additional information on the college or to obtain the standards and guidelines, write:

American College of Medical Genetics
9650 Rockville Pike
Bethesda, MD 20814-3998

A list of American Board of Medical Genetics (ABMG)-certified individuals listed by specialty and by state may be obtained by consulting the Official ABMS Directory of Board Certified Medical Specialists (27th ed., 1995).

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Recent Advances in Molecular Cytogenetics: Fluorescent *in situ* Hybridization

Hon Fong Louie Mark, PhD, FACMG

Fluorescent in situ hybridization is the most direct method for visualizing a specific DNA sequence on the metaphase chromosome or an interphase cell.

The molecular cytogenetics technique using fluorescent *in situ* hybridization (FISH) has been called a most significant advance in human genetics. When used to supplement conventional cytogenetics, this and other investigational techniques represent significant advances in the delivery of health care in the clinical cytogenetics laboratory. This article provides examples to illustrate the use of the technique of FISH in a clinical setting for improved patient care.¹⁻³

Interphase Cytogenetics via Fluorescent *In Situ* Hybridization

FISH is a relatively new investigational technique that exploits the availability of recombinant DNA technology.¹⁻³ In metaphase FISH a specific nucleic acid sequence (probe) is bound to the homologous segment on a metaphase chromosome in a fixed preparation on a glass slide. The presence of a region-specific DNA sequence in a nondividing cell also can be detected in interphase cells. Thus, this procedure is sometimes called interphase cytogenetics. In instances where dividing cells required for chromosome analysis are either lacking because of low mitotic indices or suboptimal metaphase preparation, FISH is preferred over conventional cytogenetic analysis via GTG-banding (G-banding using the protease trypsin and Giemsa stain as reagents).

Molecular Cytogenetics of Cancer

The past decade has seen the establishment of conventional cytogenetics as part of the routine management of cancer patients.

Cytogenetics via various banding techniques is an established clinical test used by clinical hematologists and oncologists. Bone marrow cytogenetics via GTG-banding is a

highly informative test that enables the inspection of the entire human genome at a glance (Figure 1).⁴ However, GTG-banding analysis sometimes suffers from the shortcoming that it must be performed on metaphase or dividing cells. Interpretation is also difficult when one encounters a suboptimal preparation, which is not uncommon in cancer specimens.

FISH, using various chromosome-specific probes, can provide information on chromosome copy number and on the presence or absence of particular DNA sequences in both metaphase and interphase cancer cells.^{5,6} For example, the presence of trisomy 8, an aneuploidy often found in the myelodysplastic syndromes (MDS), can be readily detected using FISH with alpha-satellite probes (Figure 2). Using this technique, my laboratory, in collaboration with Drs Crowley and Rintels of the Department of Clinical Hematology at Rhode Island

Hospital, has been able to study hematopoietic differentiation using bone marrow and peripheral blood smears in addition to standard slides prepared from fixed cultured cells. The ability to obtain information on interphase nuclei in addition to metaphase cells is indeed a significant advance that extends the range of study possible for cancer tissues. Towards this end our laboratory has also been performing FISH as an adjunct to GTG-banding in solid tumors.^{7,8} Further recognizing the potential of this

ABBREVIATIONS USED

BMT: Bone marrow transplants
CALGB: Cancer and Leukemia Group B
DNA: Deoxyribose nucleic acid
FISH: Fluorescent in situ hybridization
GTG: G-banding using the protease trypsin and Giemsa stain as reagents
MDS: Myelodysplastic syndrome



Fig 1.—The human genome at a glance (GTG-banding technique).

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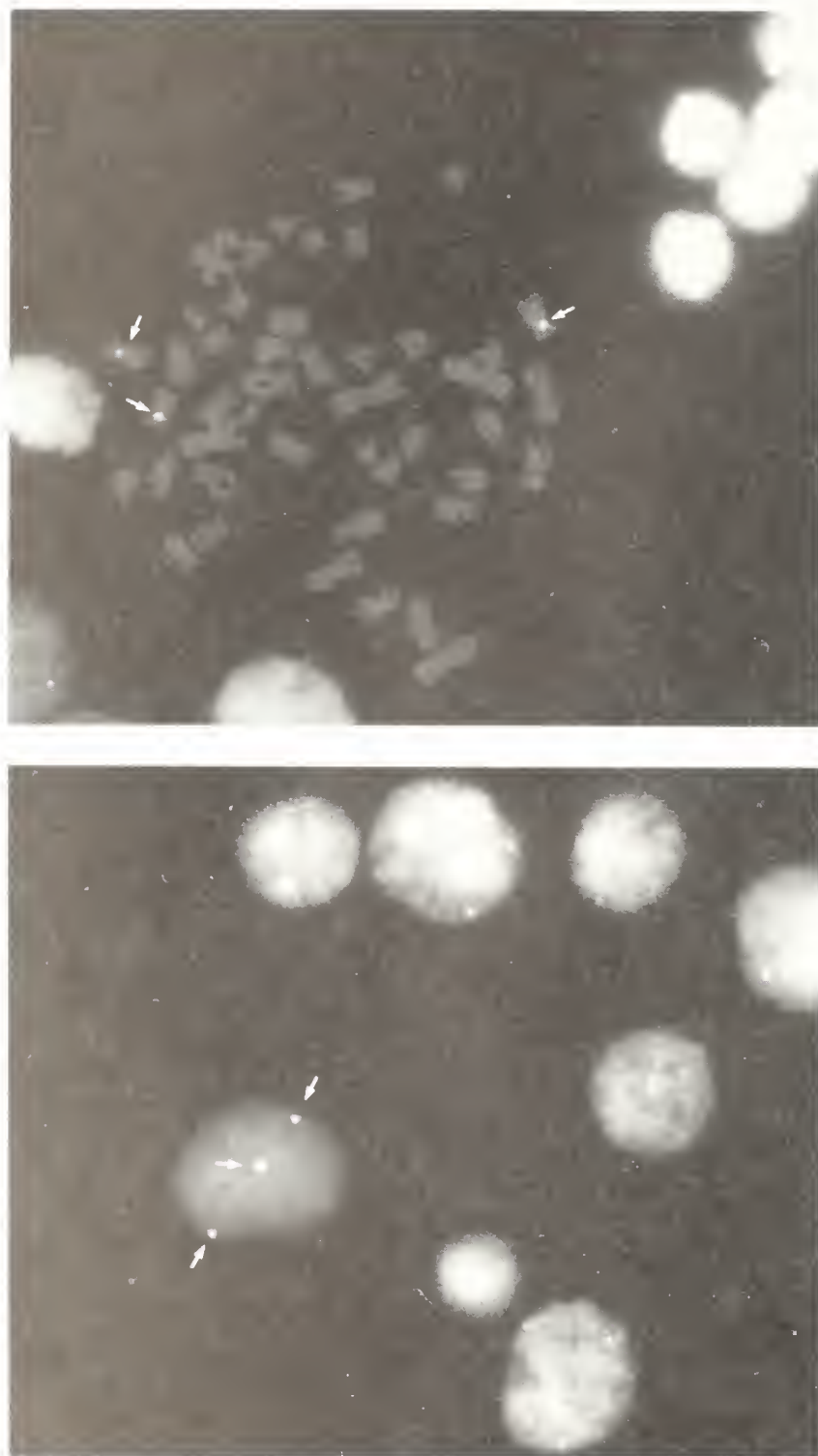


Fig 2.—FISH using an alpha-satellite chromosome 8-specific probe, illustrating chromosome 8 trisomy. A metaphase cell is shown on the top panel (Fig. 2a) whereas an interphase cell is shown on the bottom panel (Fig. 2b). In the original photo the signals appeared yellow-green and the cells red. (Reproduced with permission from the *Annals of Clinical and Laboratory Science*)

area of investigation, we are collaborating with Dr Kirby Bland to study breast cancer, a traditionally difficult tissue on which to perform cytogenetic analysis.

Another area where FISH may be useful

is in monitoring engraftment in sex-mismatched bone marrow transplants (BMT) as well as monitoring for the presence of a low level of leukemic cells. We were able to detect the presence of male (XY) and fe-

male (XX) cells in a transplanted male leukemic patient using the technique of multi-color FISH.

The Rhode Island Hospital cytogenetics laboratory is the Cancer and Leukemia Group B (CALGB)-endorsed cytogenetics laboratory in Rhode Island and is headed by a board certified clinical cytogeneticist. Dr Louis Leone, in turn, heads the program for Rhode Island Hospital, which is one of only 30 such programs in the country. The detection of minimal residual disease is only one of the many areas under active investigation in cancer cytogenetics.⁹

Applications in Endocrinology

An immediate consequence of the ability to assess chromosome copy number in interphase as well as metaphase cells is a potentially larger sample of cells for mosaicism study. A clinically relevant chromosome in which mosaicism detection is important is the Y chromosome. FISH detection of the Y chromosome is illustrated in Figure 3. This is the same probe that detects loss of the Y chromosome in leukemia and in certain elderly males. A recent case from Dr Ivor Jackson's department at Rhode Island Hospital necessitated the use of multi-color FISH with a Y chromosome probe. The patient, a phenotypic female with primary amenorrhea, hypergonadotropic hypogonadism and growth retardation with short stature and failure of secondary sexual development, is a mosaic for two cell lines: 45,X and 46,XY. Using multi-color FISH, we derived a more accurate picture of the distribution of the two cell populations in the patient. The detection of the 46,XY cell line in a 45,X background is important because of the increased risk of a gonadoblastoma.

In this connection, it should be mentioned that scoring of FISH signals must be performed under stringent quality control guidelines so that meaningful conclusions can be drawn.

For patients with a question of structural rearrangements of the sex chromosomes, such as a translocation, FISH can be performed using "chromosome painting" probes, an investigational technique currently being performed in this laboratory as an adjunct to conventional cytogenetics.

Applications for Urology, Reproductive Biology and Infertility Programs

Assessment of chromosome copy number in sperm can be performed using FISH on semen smears. This laboratory, in collaboration with Dr. Mark Sigman of the Department of Urology at Rhode Island

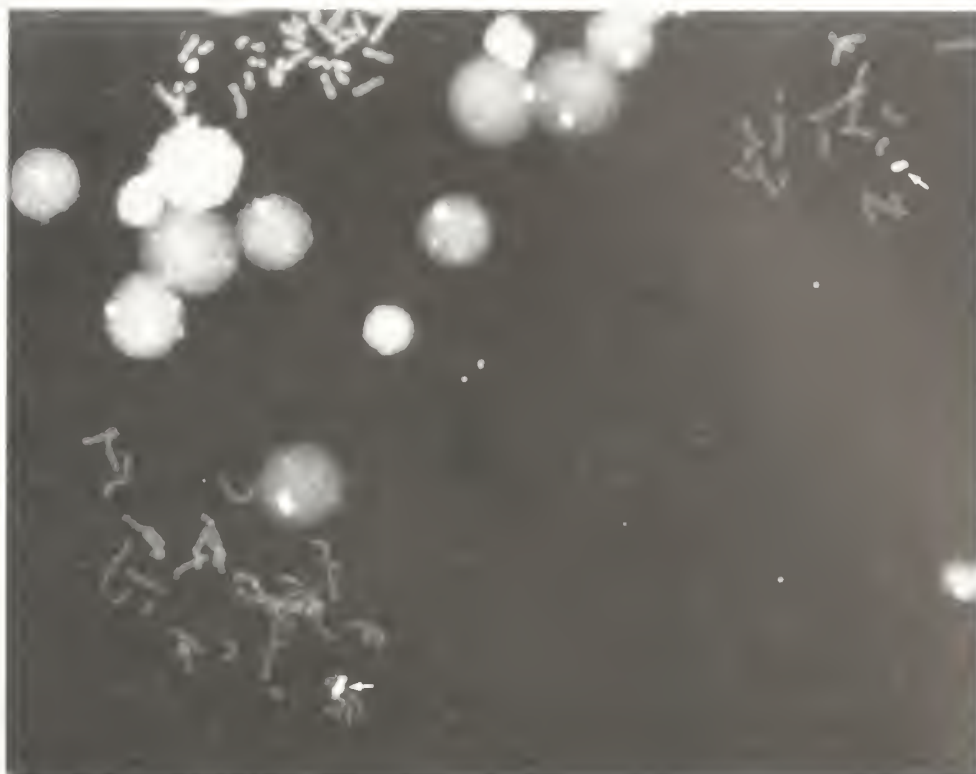


Fig 3.—FISH using a Y chromosome-specific probe. In the original photo signals appeared yellow-green and the cells red. Loss of the Y chromosome is observed in male patients with leukemia but has also been reported in elderly males. (Reproduced with permission from the Annals of Clinical and Laboratory Science)

Hospital, has demonstrated the feasibility of using the FISH assay in semen smears to detect targeted chromosome aneuploidies.

FISH has the potential to be used in a human *in vitro* genotoxicology programs as well as infertility studies. The sperm aneuploidy assay, pioneered by others using various techniques, is an area under active investigation using the tool of FISH in this laboratory.¹⁰⁻¹⁸

Aneuploidy in sperm can be detected using alpha-satellite and classical satellite probes. This type of study can yield important information on the frequency of spontaneous and induced nondisjunction and on the effects of various mutagens (aneugens) and carcinogens. Eastmond and Pinkel, for example, studied aneuploidy-inducing agents in human lymphocytes using FISH.^{19,20} Similar studies can be performed on unfertilized oocytes in an *in vitro* fertilization program as well.

Cancer of the Reproductive Systems

In collaboration with Dr Braun's laboratory at Brown University²¹ we have cytogenetically characterized three cell lines derived from primary cervical tumors. FISH assessment of specific chromosome copy number was performed to corroborate GTG-

banding studies.

In situ hybridization using chromosome 1 specific probes to study ductal *in situ* carcinoma was recently described by Givercman et al.²²⁻²⁴ They used the nonisotopic nonfluorescent *in situ* hybridization technique. FISH is a more sensitive technique than NISH,²⁵ which we plan to apply for the above study in collaboration with Drs Sigman and Stein of the Department of Urology at Rhode Island Hospital. Using FISH on formalin-fixed, paraffin-embedded sections that are nearly 20 years old, the distribution of trisomy 8 signals in various tissues of a patient with gestational trophoblastic disease is being evaluated in collaboration with Dr Lathrop, allowing simultaneous assessment of cytogenetics and histopathologic information.

Marker Identification Using FISH

Accurate identification of marker chromosomes and mosaicism detection is important for genetic counseling, for prenatal diagnosis and as part of the work-up for patients with congenital malformations, developmental delay, mental retardation and other clinical manifestations. The identification of a supernumerary marker chromosome in a patient from our laboratory was

described by us³ as was the use of FISH to determine whether the marker was centric, the reproductive consequence of a centric marker and an acentric fragment being different. The former, the case of i(18p) is a well-defined syndrome described by Callen et al and Phelan et al.²⁶⁻²⁸

Use of FISH in Pediatrics

The importance of the role of cytogenetics in medicine was established in 1959 when Lejeune described an extra G-group chromosome in Down Syndrome.²⁹ Other reasons for cytogenetic referral include detection of the classical chromosome syndromes (Down, Patau, Edward Syndromes), determination of the karyotype in individuals with multiple congenital anomalies, including ambiguous genitalia, in parents or siblings of patients with chromosomal abnormalities, in children of individuals with balanced or

structural chromosomal abnormalities, in couples with histories of two or more fetal losses, in abortions and malformed stillborns, in individuals with mental retardation, for chromosomal analysis of amniotic fluids from mothers of advanced age or a history of genetic problems, in individuals with chromosomal instability syndromes, and in individuals exposed to carcinogens, radiation and other genotoxins.³⁰ FISH is used with increasing frequency to augment the power of conventional cytogenetics. For example, the delineation of a complex structural rearrangement in a patient was achieved using multi-color FISH using chromosome painting probes (Abuelo, Mark, and Bier, unpublished data).

A microdeletion is a small deletion of chromosomal material. It is sometimes called contiguous gene syndrome or segmental aneusomy. To detect microdeletions such as those found in the Wolf-Hirschhorn Syndrome (chromosome 4p deletion), the Cri-du-Chat Syndrome (chromosome 5p deletion), Retinoblastoma (chromosome 13q deletion), the Miller-Dieker Syndrome (chromosome 17p deletion), the Prader-Willi Syndrome (chromosome 15q deletion), the Angelman Syndrome (chromosome 15q deletion), and the DiGeorge Syndrome (chromosome 22q deletion),

high resolution banding techniques are used. With the advent of recombinant DNA technology, our laboratory has been applying the FISH technique as an adjunct to GTG-banding to detect microdeletions.

As the technique of FISH is still considered investigational and commercial probes for FISH are not yet FDA-approved, data based on the use of this technology in a diagnostic setting must be interpreted with caution. The New England Regional Genetics Group recommended that issues of sensitivity, accuracy, and applicability need to be addressed more fully before accepting this technology in routine practice.³¹ This is also consistent with the recommendations of the American College of Medical Genetics,³² which states that investigational studies must be distinguished from accepted clinical tests and that this information be clearly given in a qualifying statement.

The same technology that enables one to detect microdeletions in pediatrics can be applied for the analysis of such cancer related genes as *bcr/abl* involved in the Philadelphia translocation, the *p53* gene involved in many cancers, *Her-2/neu* in breast cancer, *ras* as well as other proto-oncogenes. In this connection, it should be mentioned that presymptomatic testing in cancer families is a particularly fruitful area of research.

The Fragile X Syndrome

About 1 in 1200 males and 1 in 2500 females have the Martin-Bell Syndrome.³³ These patients express the folate sensitive fragile site at Xq27.3³⁴ under special culture conditions and are said to have the Fragile X Syndrome. This syndrome, found in all ethnic groups, is estimated to be second only to Down Syndrome as a cause for mental retardation in males.³⁵ A fragile X cytogenetic test can be considered positive when at least 4% of metaphases contain a fragile X chromosome. The sample requirements are at least 75 cells in males and at least 100 cells in females. A mutation occurring in fragile X positive patients has been defined³⁶ and DNA testing for fragile X is now available. According to the guidelines of the ACMG, molecular diagnostics should be recommended in cases where less than 4% of cells are found to be positive via fragile X cytogenetics. It is appropriate that cytogenetic work-up of patients suspected of having Martin-Bell syndrome include a conventional banding analysis³⁷ to rule out an abnormality elsewhere in the genome, which is composed of 3×10^9 basepairs of DNA: DNA testing for fragile X can identify mutation in the Xq27.3 region only and no other. Surveys of institutions for the retarded have demonstrated non-fragile X chro-

sosomal disorders in 6% to 7% of patients with features of the Fragile X Syndrome.^{38,39}

Of the fragile-X negative samples found to have abnormalities elsewhere in the genome, some have sex chromosome aneuploidies such as the Klinefelter Syndrome. We and others have also identified patients with mosaicism for trisomy 8 as well as sex chromosomal abnormalities that were referred to us because of a question of fragile X. Some of these non-fragile X chromosome cases were mosaics, further necessitating cytogenetic analysis of the appropriate number of cells to rule out a subpopulation with the abnormality.

In conjunction with conventional cytogenetics, fluorescent in situ hybridization can provide valuable information expediently so that a rational decision can be made regarding efforts of newborn resuscitation.

In view of the above, caution should be exercised pertaining to genetic testing of patients with a question of the Fragile X Syndrome in the absence of a positive family history. The newest policy statement from the ACMG on the diagnostic and carrier testing of the syndrome recommend a combination of cytogenetics and DNA testing. If one is testing specifically for fragile X and associated nucleotide expansion in the FMR1 gene, or for individuals who are at risk due to an established family history of the Fragile X Syndrome, DNA analysis should be performed. If the etiology of the mental impairment is unknown, DNA analysis to detect the syndrome should be performed as part of a comprehensive genetic evaluation which includes routine cytogenetic analysis. As the ACMG states, "cytogenetic studies are critical since constitutional chromosome abnormalities have been identified as frequently or more frequently than fragile X mutations in mentally retarded individuals referred for fragile X testing."

Rapid FISH Protocol for STAT Chromosome Analysis

It is important that all relevant information be made available to parents of a critically ill, severely malformed newborn before surgical intervention. Recently a rapid FISH protocol (Oncor, Gaithersburg, MD) was described that enables STAT analysis using FISH as an adjunct to STAT chromosome analysis using bone marrow.⁴ In the past, STAT cytogenetics was possible only through the analysis of bone marrow, where spontaneous dividing cells can be found

without stimulation with a mitogen in culture.

Thus, in conjunction with conventional cytogenetics, FISH can provide valuable information expediently, so that a rational decision can be made promptly regarding efforts of newborn resuscitation without causing additional anguish to the parents. The two most frequently encountered reasons for referral in this category are for confirmation of trisomy 13 (Patau Syndrome) and trisomy 18 (Edward Syndrome).

Other Applications

FISH can be used to monitor minimal residual disease in cases where the initial cytogenetic analysis detected a clonal trisomy. This is important during the course of chemotherapy to ensure that there is complete remission. FISH can be performed on bone marrow and peripheral blood smears, bone marrow aspirates and bone core biopsies. Buccal smears and other cytological specimens and touch preparations on specimens such as breast also can be used. FISH can be performed on slides prepared using collagenase-digested tissues. Formalin-fixed paraffin-embedded tissue sections or disaggregated cells from these sections are also suitable for FISH studies. In cases where the sample is insufficient and the preparation is suboptimal for GTG-banding on metaphases, interphase FISH can be performed. FISH does *not* require a new specimen. It can be performed on the origin specimen submitted for cytogenetics or hematologic evaluation. Additional samples from the patients are usually not required nor are different methods of collection. Both air-dried slides and flame-dried slides prepared from fixed cells are suitable for FISH. We have even performed FISH on archival material nearly 20 years old.

Lastly, FISH has applications in genotoxicology testing. Traditionally, genotoxicity testing in patients exposed to radiation or potentially hazardous compounds have been performed using the chromosome aberration assay or sister chromatid exchange analysis. Dicentric, one type of chromosome aberration, has been used as a biomarker for chromosome damage. However, it has been found that dicentrics were not stable with time.⁴⁰⁻⁴³ However, detection of translocations, which are stable with time post-exposure, can be achieved using FISH and chromosome painting probes.⁴⁴⁻⁴⁶

Summary

FISH is the most direct method for visualizing a specific DNA sequence on the metaphase chromosome or an interphase cell. It allows for both enumeration and localization of a DNA sequence underlying

a cytogenetic abnormality. In addition, FISH requires no additional acquisitions of samples. It can be performed on unstained or previously Giemsa-stained slides and also unstained as well as previously Wright-stained smears of both peripheral blood and bone marrow. It can also be performed on many other tissues and archival material previously not amenable to study. In short, FISH as an adjunct to GTG-banding holds enormous promise.³ Its full potential has yet to be explored.

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I thank my many physician colleagues, without whom none of the studies would be possible. I also wish to acknowledge the continued support of Dr Roger Mark and the dedicated staff of the Laboratory of Cytogenetics, FISH and Genotoxicology, which celebrates its 30th anniversary of service to our patients and the Rhode Island medical community this year.

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Ileal Pouch-Anal Anastomosis: The "Ideal" Operation For Ulcerative Colitis and Adenomatous Polyposis Coli?

Victor E. Pricolo, MD, FACS

Recent advances in the surgical management of ulcerative colitis (UC) and adenomatous polyposis coli (APC) have produced very satisfactory results. Refinements in surgical technique and peri-operative management and better understanding of ano-rectal physiology offer patients affected by UC and APC an operation that represents a nearly ideal solution. The "ideal" operation should satisfy four major criteria: 1) it should be curative, providing complete eradication of the disease; 2) it should be safe, carrying an acceptably low morbidity rate; 3) it should be applicable to virtually all affected patients; and 4) it should restore quality of life, especially for enteric continence.

Patients with UC require surgical intervention for three specific reasons: life-threatening complications, medical intractability, or cancer risk. Severe complications include hemorrhage, symptomatic stricture, perforation with sepsis, fulminant colitis, or toxic megacolon. These patients often are debilitated by anemia, malnutrition, and altered immune competence as a result of their disease and of medical therapy with corticosteroids and other immunosuppressant drugs. Patients may acutely or chronically become unresponsive to, or develop major side effects from, pharmacologic therapy. Patients with long-standing (over 10 years) extensive disease (pancolitis), regardless of disease activity, may develop epithelial dysplasia with significantly increased risk of colorectal carcinoma. Cancer risk (virtually 100% by age 40) justifies surgery for APC.

All these patients should undergo definitive surgical intervention, which may need to be staged, according to various factors. Four operations historically have been offered to patients to meet the "ideal" goals.

An abdominal colectomy with preservation of the rectum and ileo-rectal anastomo-

sis is generally safe and does not usually affect enteric continence, despite the markedly increased number of daily evacuations. However, it is not curative, since it leaves behind a rectum that is involved in the disease process in most cases.¹

A more radical solution is complete removal of anus, rectum, and colon (standard proctocolectomy) with permanent ileostomy. This procedure is still the gold standard against which alternatives should be compared. It is certainly a curative operation that can be used in virtually every case. Although the majority of patients adapt well to handling an abdominal stoma, this forever modifies one's self image, lifestyle, habits, and interpersonal relations.

In 1969 Nils J. Kock, from Sweden, described a new procedure that offered an improvement in quality of life. The operation involves fashioning an ileal reservoir, which can be emptied a few times a day by the patient by inserting a catheter into the skin stoma through a nipple-valve formed by intussuscepting an ileal loop.² This "continent ileostomy," or Kock pouch, has undergone several technical modifications to reduce its high need for surgical revision (20%–40%), and eventually achieves "continence" in more than 90% of cases.³ Unfortunately, this option still does not eliminate a permanent, albeit much less evident, skin stoma, and requires a great deal of patient education and reliability. Most major centers have abandoned this procedure. It is now reserved for the rare patient who has already undergone a standard proctocolectomy with conventional ileostomy and is dissatisfied with it.

The ability to preserve the anal sphincteric complex, not affected by the disease, and to anastomose an ileal reservoir to it, has led in the past 15 years to the ileal pouch-anal anastomosis (IPAA) or restorative proctocolectomy. This procedure can be curative, has acceptable morbidity, is applicable to most patients, avoids a permanent ileostomy, and usually offers satisfactory continence. For these reasons, the IPAA is the option available today closest to the "ideal" operation, and has recently undergone technical modifications that have fur-

... the ileal pouch-anal anastomosis is the option today closest to the "ideal" operation, and has recently undergone technical modifications that have further improved its functional results.

ther improved its functional results.

Why Does the IPAA Work?

To better understand the reasons for the successful clinical applicability of the IPAA, it is worth briefly reviewing its development and its effects on anorectal pathophysiology.

The idea to anastomose ileum to the anal sphincters is not recent, and was first suggested by Nissen in 1933,⁴ and later experimented in dogs and proposed in humans by Ravitch and Sabiston in 1947.⁵ In 1977 Martin reported good results with total colectomy and mucosal proctectomy with ileo-anal anastomosis in a small series of patients with ulcerative colitis.⁶ The procedure was popularized by Parks and gained progressive acceptance in the 1980s.⁷ It soon became evident that, except in very small children, a straight ileo-anal anastomosis would lead to an unacceptably high frequency of evacuations (more than 20 per 24 hours), while fashioning an ileal pouch or reservoir would be advantageous (average of 6 evacuations per 24 hours). Different shapes have been described for pouch design that can use two, three or four intestinal loops (eg, J, S, W, and other configurations). While larger pouches may have greater initial capacity, the choice of pouch shape is generally the result of the surgeon's preference, and no definite functional advantage has been shown, especially after long-term adaptation.^{8,9}

Over the past few years, this procedure has undergone further evolution, aimed at improving fecal continence rates and reducing the number of operative stages.

A major area of controversy at present deals with the choice between the more traditional technique of rectal mucosectomy with hand sewn ileo-anal anastomosis, and the newer double-stapled technique. The former procedure was based on the belief that most important in the perception of the urge to defecate were stretch recep-

ABBREVIATIONS USED

APC: adenomatous polyposis coli
IPAA: ileal pouch-anal anastomosis
UC: ulcerative colitis

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Table 1.—Anal manometric evaluation before and after ileal pouch-anal anastomosis (N=22).

	Internal Sphincter Pressure		External Sphincter Squeeze	
	(mean)	(range) mmHg	(mean)	(range) mmHg
Preoperative	62.5	40–90	80.3	50–150
Postoperative (early)	55.6	30–85	76.6	40–150
Postoperative (late)	61.3	40–90	81.5	50–150

tors present in the lower muscularis propria of the rectum. On that basis, the operation would leave a rectal muscular cuff and excise the rectal mucosa down to the dentate line. However, the functional results after that operation, even in the hands of the most experienced surgeons, led to perfect continence in 75% of patients during daytime and only in 45% of patients during sleep.¹⁰ These problems of nocturnal spotting were particularly frequent in women. Pathophysiologic studies of anorectal function have recently emphasized that the mucosa about the dentate line (transitional epithelium) has specialized receptors that, in the presence of rectal distention, allow relaxation of the upper anal canal to discriminate between gas and solid matter (sampling reflex).¹¹ In the presence of solid matter, a reflex contraction of the lower anal canal musculature prevents soilage, an involuntary mechanism particularly helpful in maintaining night-time continence. With this rationale, preservation of the lower 1 to 2 centimeters of rectal mucosa has been suggested. This goal can be accomplished by performing the proctectomy entirely from inside the abdomen, transecting the rectum at the level of the levator ani muscles after stapling the ano-rectal junction, and performing a stapled ileal pouch-anal anastomosis right above the dentate line (double-stapled technique). This operation has proven safe and effective. In several clinical series this technique has significantly improved both daytime (85% to 90%) and nighttime (75%) perfect continence rates.^{12,13} This improvement may be due also to the lack of anal manipulation at the time of surgery.¹⁴ The concern about leaving a small strip of diseased mucosa in place, which occurs in about 30% to 50% of cases, makes periodic follow-up anoscopy a safe plan at the present time. A prospective randomized study comparing rectal mucosectomy with the double-stapled technique recently has been initiated at the Mayo Clinic, with the sponsorship of the Crohn's and Colitis Foundation of America.

Another area of controversy presently regards the need for a temporary ileostomy to protect the ileo-anal anastomosis. Although some authors favor omitting a temporary stoma,¹³ most series have reported a

significantly greater anastomotic leak rate, especially in patients who are males, over age 40, and on chronic corticosteroids.¹⁵

The specific complications of the IPAA procedure include anastomotic stricture; perianal abscess, fistula, or anastomotic sinus; intra-abdominal abscess or fistula; and functional pouch problems. In the presence of such problems requiring reoperation, 70% of patients will still have an excellent outcome, but 20% will need pouch removal.¹⁶

Pouchitis, an inflammatory process of the ileal mucosa of the pouch, can cause symptoms of abdominal cramps, watery or bloody diarrhea, malaise, and fever. Most cases respond promptly to antibiotic treatment (metronidazole), which would support the thesis of stasis with bacterial overgrowth as the pathogenetic mechanism. However, pouchitis remains a rather poorly understood entity. Interestingly, it is much more common in chronic ulcerative colitis patients (25% to 30%) than in familial polyposis patients (5% to 6%).^{17,18} As the pouch epithelium, over time, assumes histological and histochemical characteristics resembling colonic epithelium (colonic metaplasia), it may become a target of immunologic interactions analogous to UC. Pouchitis and the immunology of inflammatory bowel disease remain major research challenges.

Overall restoration of quality of life to normal range (sports and recreation, social life and entertainment, occupational work, work around the house, travel, family life, sexual life) has been demonstrated in over 90% of patients in a good number of clinical reviews.^{19, 20}

Personal Experience

Since April 1991, ileal-pouch-anal anastomosis after proctocolectomy has been offered at Rhode Island Hospital to suitable candidates. This program has been implemented thanks to the collaboration and support of the Divisions of Adult and Pediatric Gastroenterology, the Nutritional Support Service, and Enterostomal Therapy.

Postoperative functional results are available at present in 30 patients, 19 females and 11 males, ranging in age between 12 and 66 years (mean=32). In 24 patients, the histopathological diagnosis was ulcerative colitis, in six adenomatous polyposis.

Nineteen patients presented with life-threatening complications of UC, requiring total abdominal colectomy with rectal Hartmann pouch and Brooke ileostomy as the initial procedure. After 2 to 6 months, they underwent completion proctectomy with ileal pouch-anal anastomosis. In 11 other patients with chronic intractable disease, or APC, the proctocolectomy with IPAA was performed as a single procedure. Selection of patients as candidates for continence-preserving procedure included a preoperative anorectal manometry. Twenty-four patients had a temporary ileostomy that was closed after 6 to 10 weeks. Before closure of the temporary stoma, all patients underwent functional evaluation of anal and pelvic pouch function by manometry, and contrast study of the pelvic pouch (pouchogram) to assess continence and exclude anastomotic leak or fistula. In 26 patients, the double-stapled technique was used, while 4 patients had mucosectomies and hand-sewn anastomoses. It is important that the surgeon be familiar with both techniques.

Functional results of my experience at Rhode Island Hospital are reported in Tables 1 and 2. Anal manometric studies reveal that there is no lasting change in internal or external sphincter function in most patients after IPAA. Adaptation and pelvic floor exercises lead to further improvement at late (3 to 6 months) postoperative follow-

Table 2.—Functional results and quality of life after ileal pouch-anal anastomosis (N=30)

Functional Results	
24-hr stool frequency	4–8 (mean: 5.8)
Daytime stool frequency	4–6
Nighttime stool frequency	0–2
Perfect daytime continence	28/30
Occasional daytime spotting	2/20
Daytime leakage	0/30
Perfect nighttime continence	26/30
Occasional nighttime spotting	4/30
Nighttime leakage	0/30
Quality of Life	
Dietary restrictions (early)	30/30
Dietary restrictions (late)	3/30
Psyllium hydrophilic mucilloid	16/30
Occasional antidiarrheal drug	8/30
Sexual dysfunction (early)	2/30
Impotence	0/11
Dyspareunia (early)	1/19
Limitations in daily activities	0/30
Lifestyle improvement since UC	30/30
Lifestyle improvement since stoma	30/30

up. Continence rates are satisfactory, and most patients are able to discriminate between gas and solid. Stool frequency is largely dependent on dietary habits. All patients are initially advised to adhere to a fiber and residue restricted, low lactose diet. Most patients eventually progress to no dietary restrictions.

Evacuations range from 4 to 6 during daytime, and from 0 to 2 at nighttime. All patients are advised to take psyllium hydrophilic mucilloid daily. No patients report restrictions in daily activities, work, and recreation. One woman experienced early dyspareunia, and one man decreased ejaculation. Three patients experienced diversion pouchitis, which promptly responded to ileostomy closure. Two patients have reported transient inflammation of the retained mucosa above the dentate line, which responded to a short course of topical 5-aminosalicylic acid or corticosteroids. All patients state that their lifestyle has significantly improved after the operation.

On the basis of the literature review and personal experience, it appears that this technique of IPAA is at present the procedure closest to the "ideal" operation for ulcerative colitis and adenomatous polyposis coli. Longer follow-up and analysis of functional outcome, along with a better understanding of certain entities (eg, pouchitis) may lead to further modifications in surgical strategy.

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Skier's Thumb: A Review

Michael Roh, BA, Arnold-Peter C. Weiss, MD, Edward Akelman, MD

Skier's thumb describes an injury of the ulnar collateral ligament of the thumb metacarpophalangeal joint. As the name implies, this condition is the most common upper extremity injury in skiing, and is second only to medial collateral ligament injury of the knee as the most commonly reported skiing injury.¹ It is thought that during a fall the ski pole places the thumb in forced abduction at the moment of impact, thus jeopardizing the ulnar collateral ligament of the thumb metacarpophalangeal (MCP) joint. Football and boxing are also sports with a high risk of damaging the ulnar collateral ligament. Originally, this injury was known as "gamekeeper's thumb," named after an occupational injury of Scottish gamekeepers caused by their method of breaking the necks of wounded hares.² Regardless of the particular eponym in use, an accurate diagnosis followed by judicious surgical intervention is essential in the treatment of this injury.

Anatomy

The thumb MCP joint is essentially a hinge joint with some rotatory motion. One of its major stabilizing structures, the palmar plate, consists of two parts: a firm fibrocartilagenous portion distally (containing two sesamoid bones), and a relatively thin proximal portion known as the pars flaccida. The proper portion of the ulnar collateral ligament (UCL) originates from the metacarpal head passing in a distal and palmar direction to insert on the lateral tubercle of the proximal phalanx; it is taut in full flexion of the MCP joint and lax in full extension. The accessory ulnar collateral ligament is slightly superficial and palmar to the proper UCL, and its fibers blend distally with the fibrocartilagenous palmar plate; it is taut in full extension and lax in full flexion. The adductor pollicis has three

insertions: one into the ulnar sesamoid bone and palmar plate, a second into the lateral tubercle of the proximal phalanx, and a third that takes the form of a dorsal expansion, known as the adductor aponeurosis. The adductor aponeurosis blends with the dorsal aponeurosis and extensor pollicis longus tendon, and must be divided to afford exposure of the torn UCL.

Biomechanics

Though ranges of motion vary from person to person, and even from left to right, the average flexion of the thumb MCP joint is 75°, and the average extension is 20°. Capsuloligamentous stability of the joint allows an average of 15° of passive excursion under radiographic stress tests, with left to right variation averaging about 2°. Typically, with chronic failure of the UCL in the setting of an intact radial collateral ligament, a rotational deformity (supination) results. Insufficiency of the thumb ulnar collateral ligament is also associated with weakness of both tip and key pinch, since both these actions require resistance

... with chronic failure of the ulnar collateral ligament in the setting of an intact radial collateral ligament, a rotational deformity (supination) results.

of the thumb to forced abduction. The adductor pollicis and palmar plate provide dynamic stabilization, particularly against radial deviation. Damage to the adductor pollicis, however, has been shown to have little effect on thumb MCP stability.³

Pathology

The UCL can be torn distally, proximally, or in its substance. The ratio of distal to proximal tears has been reported at 5:1, and the palmar plate is often disrupted through the pars flaccida. The adductor aponeurosis is rarely torn.⁴ The "Stener lesion" refers to proximal displacement of a distally avulsed ulnar collateral ligament with interposition of the adductor aponeurosis. Studies have shown the incidence of the Stener lesion from 14% to 66%. The clinical significance of this pathoanatomy is that the adductor

Tenderness over a palpable prominence ... adjacent to the metacarpal head, in the setting of gross laxity ... has been shown to be relatively accurate in diagnosing a complete ulnar collateral ligament tear.

aponeurosis separates the proximal and distal pieces of UCL, preventing any healing from taking place.

Fractures do occur with UCL injury, varying from 23% to 50% of patients treated operatively. In the pediatric population, UCL rupture is associated with epiphyseal fractures of the proximal phalanx, Salter III being the most common. A small series of UCL injuries with large articular fracture fragments was presented, and coined "breakdancer's thumb." In the skeletally mature, fractures occur, either by avulsion or shear, as often as 60% in one series. Radiographically, one cannot distinguish a nondisplaced avulsion fracture of the distal UCL insertion (implying an intact UCL ligament) with a complete UCL rupture and concomitant ulnar volar fragment of the proximal phalanx.⁵

Diagnosis

Though the approach to diagnosing skier's thumb is controversial, the clinical examination remains the gold standard. The patient should report an acute or chronic history of forced abduction of the thumb MCP joint, in either extension or flexion. Swelling over the dorso-ulnar aspect of the MCP joint has been associated with the Stener lesion. Tenderness over a palpable prominence (theorized to be the proximal UCL stump protruding outside the adductor aponeurosis) adjacent to the metacarpal head, in the setting of gross laxity (>35° abduction with flexed MCP joint, >15° more abduction than uninjured hand) has been shown to be relatively accurate in diagnosing a complete UCL tear (Figure 1).⁶ In the initial study, however, the one false positive out of eight true positives was due to a hemaroma deep to the adductor aponeurosis led to a false positive diagnosis. Continuity of the accessory UCL/palmar plate complex was present when there was at least 20° less angulation in extension compared with the values obtained in flexion.⁷ This distinguishing feature is significant since an intact accessory UCL does not

ABBREVIATIONS USED

MCP: Metacarpophalangeal (joint)
UCL: Ulnar collateral ligament

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Fig 1.—A 20-year-old female skier fell catching her thumb on her ski pole. Examination reveals gross laxity and instability of the thumb metacarpal phalangeal joint.

require surgical intervention and could be used to decrease the number of negative explorations.

Stress radiographs are potentially useful, but little agreement exists on the best manner to obtain them. Also, they must be obtained with the MCP joint placed in flexion, which is difficult to do when wearing lead gloves. Arthrography has been shown to have some diagnostic utility, but the sensitivity and specificity have yet to be established. Magnetic resonance imaging has been shown to be 100% sensitive and 94% specific for UCL displacement, but the authors agree that the cost-effectiveness of such testing is probably low.⁸

Complete tears are amenable to several options, including suturing the ligament to itself or to periosteum, reattachment to bone via pull-out suture, or fixation via the periosteum and bone flap.

Treatment

In the interest of preventing a weak and painful pinch or painful MCP arthritis, all UCL injuries should be treated appropriately. One study noted a 50% rate of clinical failure (pain, instability, weakness, limited motion) with conservative treatment of complete UCL tears.⁹ The management of partial tears involves a 4-week immobilization period in a thumb spica cast. Complete tears are amenable to several options, including suturing the ligament to itself or to periosteum, reattachment to bone via pull-out suture, or fixation via the periosteum and bone flap. The exposure is usually a chev-

ron or curved incision on the ulnar aspect of the MCP joint, and care should be taken to avoid injury to the ulnar branch of the radial sensory nerve to the thumb.¹⁰ One British study compared steel wire versus horizontal mattress suture fixation in UCL repair and noted no significant difference in outcome.¹¹

Conclusion

The complex anatomy of the thumb metacarpophalangeal joint makes the diagnosis of skier's thumb especially challenging. This injury occurs, to some degree, in many skiers and accurate diagnosis is essential for treatment, be it conservative for partial injuries or surgical for complete tears.

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Physicians' Obligations to Withhold or Withdraw Life-sustaining Medical Treatment

David A. Wollin, JD, and Joseph Avanzato, JD

The United States Supreme Court and courts in Rhode Island have ruled that a competent adult patient has a constitutional right to refuse life-sustaining medical treatment, regardless of the consequences to the patient.

As advances in medical science make it possible to prolong life, physicians are increasingly being called upon to decide whether life-sustaining medical treatment should be withheld or withdrawn from seriously ill patients. Having been trained to save lives, physicians are required to decide, often without the benefit of clearly defined guidelines, if their patients should be allowed to die. Such "life or death" decisions can have dire consequences. Patients who wish to cling to life may die; patients who wish a quick end from their agony may continue to suffer. Physicians also may face civil or criminal liability for their actions.

In Rhode Island, the well-publicized case of Marcia Gray illustrates the dilemma facing physicians. Gray was a patient at the Rhode Island Medical Center in a persistent vegetative state. Since Gray had no reasonable likelihood of regaining consciousness, her husband requested that artificial feeding cease and that she be allowed to die. Gray's physicians opposed the request, arguing that it constituted euthanasia, was inconsistent with their roles as guardians of her well-being, and could subject them to civil or criminal liability for her death. The federal district court ultimately ordered that Gray's nutrition and hydration be removed. Although Gray was unable to communicate her wishes, the court held that she had a constitutional right to refuse life-sustaining medical treatment, including nutrition and hydration, and that this right was paramount to any countervailing interest.

While the Gray case set an important precedent in Rhode Island, it did not resolve the numerous situations that physicians confront in deciding whether to withhold or withdraw life-sustaining medical treatment. The Rhode Island General Assembly has sought to address this problem by enacting

legislation, but no comprehensive guidelines exist in this state that physicians may consult to resolve these difficult and heart-wrenching cases.

This article explores the current state of Rhode Island law on physicians' obligations to withhold or withdraw life-sustaining medical treatment (including artificial feeding and other life support measures) from competent and incompetent patients.

The Right to Refuse Life-Sustaining Medical Treatment

Physicians who must decide whether to withhold or withdraw life-sustaining medical treatment generally are confronted with three categories of patients: 1) patients who are competent to make their wishes known; 2) incompetent patients who have already executed an "advance medical directive" reflecting those wishes; and 3) incompetent patients whose wishes are not reflected in such a directive. The obligation of physicians in deciding a course of treatment will differ depending upon the type of patient under care.

Competent Patients

The US Supreme Court and RI courts have ruled that a competent adult patient has a constitutional right to refuse life-sustaining medical treatment, regardless of the consequences to the patient. The right is also reflected in Rhode Island's Health Care Power of Attorney Act and the Rights of the Terminally Ill Act, both of which state that "adult persons have the fundamental right to control the decisions relating to the rendering of their own medical care, including the decision to have life-sustaining procedures withheld or withdrawn in instances of a terminal condition."

A competent patient's right to refuse life-sustaining medical treatment is based on the fundamental concept that every person of sound mind has a right to determine what shall be done with his or her own body. The RI Supreme Court has stated that every competent adult has the "right to forego treatment, or even cure, if it entails what for him are intolerable consequences or risks

however unwise his sense of values may be in the eyes of the medical profession, or even the community."

While the right of a patient to refuse life-sustaining medical treatment is fundamental, the right is not absolute. Courts have recognized four countervailing societal interests: 1) the preservation of life; 2) the prevention of suicide; 3) the maintenance of the ethical integrity of the medical profession; and 4) the protection of the interests of innocent third parties.

Of the four societal interests, the interest in preserving life is generally considered the most important. Almost uniformly, however, courts have concluded that a competent patient's right to refuse life-sustaining medical treatment is paramount to society's interest in preserving life. Courts reason that the societal interest in preserving life must give way to the competent patient's personal interest in directing the course of his own life, particularly when the patient is enduring physical and mental pain. Thus, for instance, courts have ruled that quadriplegics who are incapable of spontaneous respiration have the right to be removed from respirators.

Likewise, a patient's right to refuse life-sustaining medical treatment is paramount to society's interest in preventing suicide. Courts reason that patients who decline life-sustaining medical treatment are not committing suicide but are merely allowing a disease to take its natural course.

Courts also have refused to limit a patient's right to reject life-sustaining medical treatment on the basis that the integrity of the medical profession would be undermined. This interest is not threatened when competent adults are permitted to refuse medical treatment. As long as physicians inform patients of the risks and benefits of a proposed course of treatment, it is the patient, not the doctor, who must bear the consequences of the ultimate decision to refuse treatment.

Courts also have upheld a patient's right of self-determination when the interests of innocent third parties may be affected. Only in very extreme circumstances, such as when

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a patient's decision to refuse treatment would result in the abandonment of minor children, have a patient's rights been supplanted.

Thus, physicians have an obligation to honor the wishes of competent adult patients who refuse life-sustaining medical treatment or request that certain devices be withdrawn. When physicians act in good faith, they will not incur civil or criminal liability in withdrawing life-sustaining treatment at the request of an informed and competent adult patient. Of course, physicians who have a moral or ethical objection to withholding or withdrawing life-sustaining treatment normally are not obligated to do so. The law generally does not compel health care providers to take active measures that are contrary to their moral or ethical beliefs. However, these providers must promptly refer the patient to another physician or health care facility that will respect the patient's wishes. If no such health care provider exists, the patient's request must be honored.

Incompetent Patients Whose Views Are Known

When a patient is incapable of making personal decisions, physicians have an obligation to determine whether the patient's views on refusing or terminating life-sustaining medical treatment have been recorded in an "advance medical directive." In fact, federal law requires that hospitals that care for Medicare and Medicaid patients provide all patients with information on advance directives.

The RI General Assembly has passed two significant statutes to permit patients to exercise their right to self-determination after they are no longer able to participate actively in decisions about their health. The Health Care Power of Attorney Act permits an adult person to make a written durable power of attorney, instructing another person (called an "agent") to make decisions about future health care decisions. The power of attorney gives the agent authority to refuse or terminate any medical care, including life-sustaining medical treatment. The agent must act in accordance with the declarant's wishes as stated in the power of attorney, such as the types of treatment that are not desired.

Similarly, the Rights of the Terminally Ill Act allows a competent adult to make a written declaration instructing his or her physician to withhold or withdraw life-sustaining procedures in the event of a terminal condition. Specifically, a competent adult may execute a declaration to the effect that if he or she becomes incompetent and has an incurable or irreversible condition that will

cause death within a relatively short time the physician must withhold or withdraw procedures that merely prolong the dying process and are not necessary for comfort or to alleviate pain. The authorization may include the withdrawal of artificial feeding. The declaration is limited to patients with a terminal condition, which is defined as an incurable or irreversible condition that, without the administration of life-sustaining procedures, will in the opinion of the attending physician result in death within a relatively short time.

Under both statutes, physicians who withhold or withdraw life-sustaining procedures from a qualified patient according to the advance directive are immune from civil or criminal liability or charges of unprofessional conduct. Even where patients revoke these advance directives, physicians cannot be held liable in the absence of actual notice of the revocation. However, physicians who refuse to comply with an advance directive must make the necessary arrangements to effect the transfer of the patient to another physician who will effectuate the directive. Failure to make such transfer will constitute unprofessional conduct.

Incompetent Patients Who Left No Advance Directive

Patients who are incompetent and have not made their wishes known through an advance directive do not lose their inherent right to refuse life-sustaining medical treatment. Such patients do not have any lesser rights merely because they are unable to exercise them or are unaware of the violation.

In these situations, most courts have adopted the "substituted judgment" standard. Under that standard, the patient's surrogate—a family member, court-appointed guardian or even physician—must endeavor to identify the choice that the incompetent patient would have made had he or she been competent to refuse or terminate medical treatment. Five factors normally are taken into account: 1) the patient's expressed preferences to family members, friends or health care providers; 2) the patient's religious convictions, particularly as they relate to life-sustaining medical treatment; 3) the impact on the patient's family; 4) the probability of adverse side effects; and 5) the prognosis with and without treatment. When an incompetent patient has never expressed an intention regarding medical treatment, the views of the patient's parents may be the best mirror of the patient's wishes.

A few courts have adopted a "best interest" standard. Under this standard, the patient's surrogate must determine what a

reasonable patient with the medical condition at issue would do, considering such factors as pain and the risks and benefits of proposed treatment.

If confronted with this question, the RI Supreme Court likely would adopt the substituted judgment standard. The Supreme Court has already adopted this standard with respect to an incompetent young woman's right to decide whether to have an abortion.

Procedures for Terminal Care Decision-making

While the Gray case and others establish that adult patients in Rhode Island have a constitutional right to reject life-sustaining medical treatment, Rhode Island law is unclear on the procedures that physicians must follow to ensure that this right is exercised voluntarily and intelligently. Few courts elsewhere have addressed this issue.

Until comprehensive guidelines are established for terminal care decision-making, there are basic procedural requirements that physicians should consider following in these circumstances. At the outset, it must be determined that a patient is competent to make an informed decision to refuse or terminate life-sustaining medical treatment. In making this assessment, the New Jersey Supreme Court requires that two non-attending physicians examine the patient to confirm that he or she is competent and fully informed about the prognosis, the medical alternatives available, the risks involved and the likely outcome if medical treatment is discontinued.

If the patient is competent, the next step is to decide whether he or she is voluntarily exercising the right to refuse or terminate treatment. The Nevada Supreme Court requires two non-attending physicians to determine whether the patient is or reasonably appears to be free of coercion or pressure in making his or her decision. If it appears that the patient is being coerced, the case should be referred to the hospital ethics committee or risk manager to attempt to resolve the matter short of litigation.

If a patient is competent and free of coercion, his or her decision to refuse or terminate medical treatment should be honored, even if the outcome would be death. If conflicts arise between the patient's wishes and the views of others, the principal physician should attempt to resolve the dispute expeditiously. If the conflicts cannot be resolved, the attending physicians normally should effectuate the competent adult's decision.

When a patient is incompetent, a physician has an obligation to determine whether an advance directive has been executed

and, if so, to execute the directive in accordance with its terms. Lacking an advance directive, a physician should assess whether there is reliable evidence that the patient, when competent, expressed a wish that life-sustaining medical treatment be withheld or withdrawn in the event he or she was in a persistent vegetative state or similar irreversible condition. For this purpose, persons who might be familiar with the patient's preferences, such as family members, friends and other health care providers, should be consulted. The patient's guardian or similar representative also must be brought into the decision-making process and concur in the physician's recommendation.

When an incompetent patient has never expressed any views on life-sustaining treatment, the patient's personal value system, including his or her philosophical, religious and moral views, should serve as a guide to decision-making. The patient's family, friends and others are in the best position to possess such important information.

If all parties are in agreement as to the patient's likely decision, the physician's course of action is clear: the patient's right to refuse or terminate life-sustaining medical treatment should be effectuated. However, when there is a conflict among family members, friends or even health care providers, there are two basic choices. The first is to attempt to resolve the conflict informally; the second is to bring the dispute to the judicial system. The first alternative should be the preferred choice. Judicial proceedings are expensive and time-consuming. Judicial review also can create unnecessary strains among the parties by forcing them into the role of adversaries in litigation.

Accordingly, the principal physician should initiate a meeting among the patient's health care providers, those individuals familiar with the incompetent patient's preferences and the guardian to discuss the situation, including the likely results of various treatment alternatives. The participants also should consider enlisting the aid of the hospital ethics committee, which can encourage these individuals to reach an accord. Absent an agreement, judicial intervention may be inevitable.

Throughout this entire process, a physician must document in the patient's chart all aspects of the decision-making process. The chart should reflect, at a minimum, discussions with the patient and his or her family, friends, guardian and others regarding life-sustaining measures; an assessment of the patient's competence and ability to act voluntarily; the circumstances surrounding the patient's consent; and any reliable evidence of an incompetent patient's wishes regarding life-sustaining treatment, including the source of such information.

Conclusion

There is an urgent need for comprehensive guidelines to address the rights of competent and incompetent adult patients to refuse or terminate life-sustaining medical treatment. Until the RI General Assembly acts, health care facilities should establish expeditious and inexpensive procedures to guide physicians, patients, family members and guardians in these situations. Ultimately, the guidelines must protect the rights of patients to die with dignity and enable physicians, family members and guardians facing this enormous problem to make informed and compassionate decisions without fear of liability and the continuous need for court approval.

[ED. NOTE—Readers who wish to obtain a list of references relied upon for this paper may call or write David A. Wollin, Esq., Adler Pollock & Sheehan Inc., 2300 Hospital Trust Tower, Providence, RI 02903-2443. Telephone: 401-274-7200]

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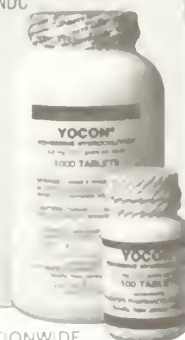
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1. A. Morales et al., New England Journal of Medicine 1221 November 12, 1981
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p 176-188
McMillan December Rev 1/85
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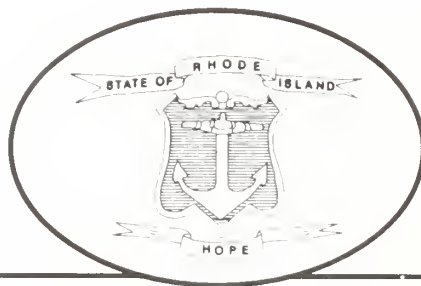


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Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Health Insurance Coverage Among RI Adults, 1993

A driving force for health care reform at the national and state levels has been the growing numbers of persons who lack coverage for their health care costs. In Rhode Island, one of the 25 state health objectives adopted in *Healthy Rhode Islanders 2000*¹ is to improve access to primary care, with one recommended "strategic intervention" being the assurance of health care coverage to all residents. In 1990, statewide health interview survey conducted every 5 years estimated that 9.2% of residents had no such coverage from either public or private sources.

In 1993, information collected through the Behavioral Risk Factor Surveillance System (BRFSS) showed that 9.8% of Rhode Island adults (ages 18 and older) were uninsured. The BRFSS is part of a national effort directed and funded by the Centers for Disease Control and Prevention in which 49 states (excluding only Wyoming) and the District of Columbia currently participate.² In 1993, the Rhode Island survey included 1,800 randomly selected persons ages 18 and older living in households with telephones.

Based on data from the 50 participating areas, Rhode Island's proportion of uninsured adults was 3.1 percentage points below the national median, placing it tenth lowest among all areas and third lowest among New England states (Figure 1). Nationally, there was nearly a four-fold variation between the lowest rate of uninsured adults (Hawaii) and the highest (Louisiana).

The likelihood of being without health care coverage depended strongly on the age and sex of the respondent (Figure 2). Younger adults were much more likely than older persons to lack coverage, due largely to their employment patterns and the near-universal coverage provided the elderly by the Medicare program. Overall, males in

Rhode Island were nearly twice as likely (13.0%) as females (6.9%) to be uninsured. The pattern persists throughout all age groups within the adult years.

Although the proportion uninsured among the employed (10.4%) and the self-employed (14.2%) are much lower than the proportion uninsured among the unemployed (32.5%), over two-thirds of the adult population without coverage consists of persons with employment (Figure 3). Many national health care reform proposals, including most of those based on incremental changes to the existing system, take advantage of this fact by incorporating employer mandates or incentives as a key strategy for achieving increased or universal coverage.

Assuring coverage for employed adults would decrease the proportion uninsured among Rhode Island adults to approximately 3%, even assuming no homemakers or students were included through provision of family coverage. Reducing the uninsured population to that level would result in a substantial improvement in the access to primary care services among the state's population.

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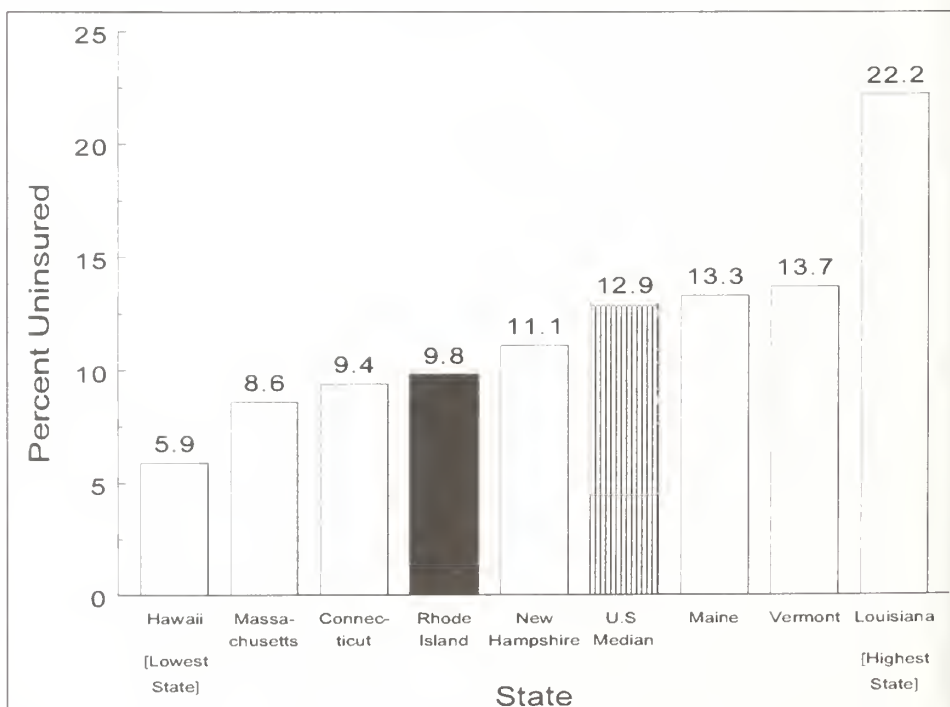


Fig 1.—Percentage of Population Ages 18 and Older without Health Care Coverage, by State, Selected States and United States Median, 1993.

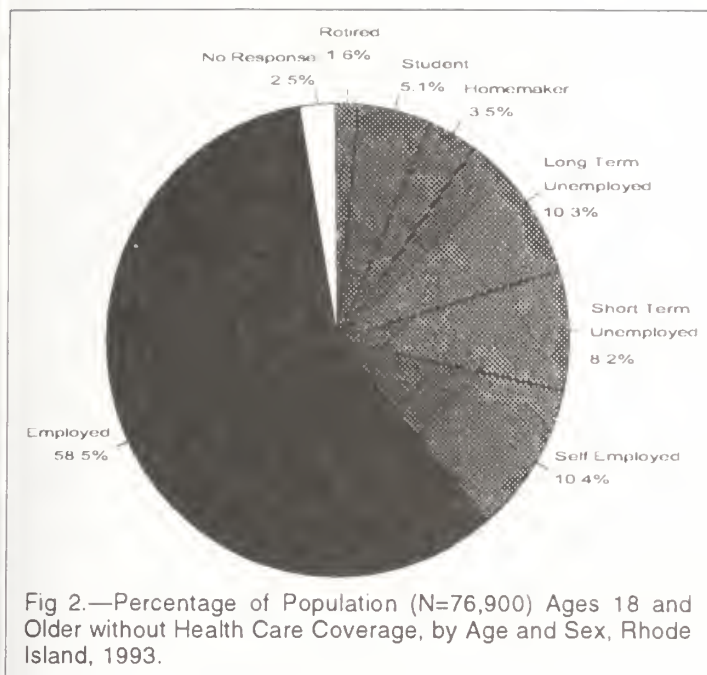


Fig 2.—Percentage of Population (N=76,900) Ages 18 and Older without Health Care Coverage, by Age and Sex, Rhode Island, 1993.

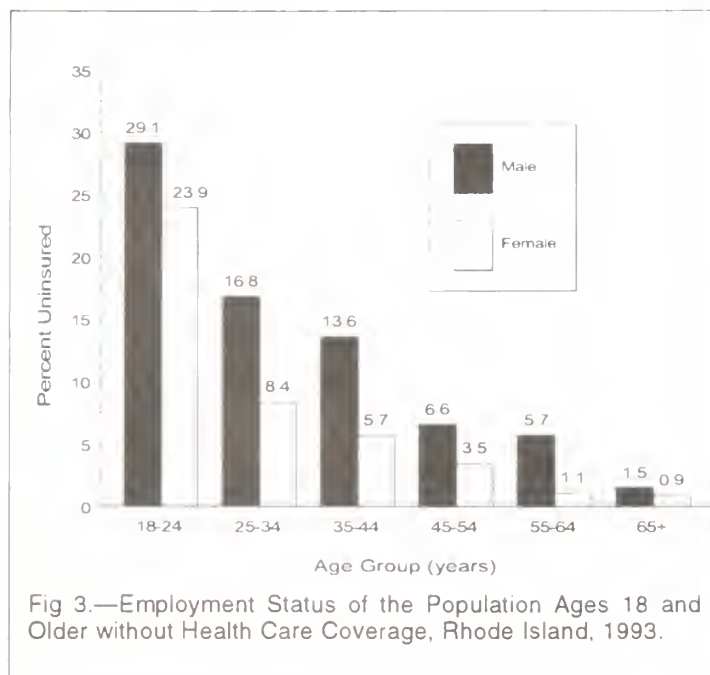


Fig 3.—Employment Status of the Population Ages 18 and Older without Health Care Coverage, Rhode Island, 1993.

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1. Feinfeld DA, al-Achkar G, Lipner HI, Chirayil SJ, Hakim J, Avram MM. Syndrome of inappropriate secretion of antidiuretic hormone: Association with cavernous sinus thrombosis. *JAMA*. 1978;240:856-857.

Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

Book Chapter

3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases*, 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Influenza: Prevention and Control

Utpala Bandy, MD, MPH

The epidemiology of influenza is characterized by frequent, unpredictable epidemics and periodic global pandemics resulting in devastating morbidity and mortality. In the US, influenza and pneumonia are the fifth leading causes of death in people 65 years or older, contributing 10,000 to 40,000 excess deaths and as many as 120,000 hospitalizations per influenza epidemic every year.

Influenza A viruses are classified by the antigenic characteristics of their surface antigens: hemagglutinin (subtypes H1, H2, H3) and neuraminidase (subtypes N1, N2). Immunity via natural disease or immunization to these antigens, especially the hemagglutinin, reduces the likelihood of infection and attenuates illness, should it occur. Over time, influenza viruses insidiously alter their antigenic properties by point mutations. Because new variants of influenza emerge every year from this "antigenic drift," the composition of influenza vaccine must be modified annually. Influenza B viruses tend to drift to a lesser extent than influenza A viruses. Pandemics are triggered by the appearance of completely new antigenic profiles through a process of "antigenic shift," believed to occur through genetic reassortment of virus between humans and the animal reservoir.

Clinical Features

Influenza causes an acute fever with headache, sore throat, nonproductive cough, and myalgia. Cough and malaise may persist for weeks. More severe illness and hospitalizations occur when influenza is complicated by primary influenza pneumonia or bacterial pneumonia. Elderly persons and persons with underlying health conditions are at increased risk of infection and for compli-

Table 1.—Complications of influenza

Respiratory

- Influenza pneumonitis
- Secondary bacterial pneumonia, particularly *Staphylococcus aureus*
- Exacerbations of chronic respiratory disease
- Laryngotracheobronchitis in children

Non-respiratory

- Otitis media
- Febrile convulsions
- Toxic shock syndrome
- Reye's syndrome
- Myositis and myoglobinuria
- Myocarditis
- Neurological sequelae, including Guillain-Barre syndrome, transverse myelitis, and encephalitis
- Subsequent meningococcal infection
- Possible increased incidence of schizophrenia if exposure is *in utero* during second trimester

cations (Table 1). Hospitalization rates increase 2- to 5-fold for high-risk persons during an epidemic. Because the proportion of elderly persons in the US is increasing, the toll from influenza can be expected to increase unless control measures are vigorously implemented. The increasing prevalence of neonatal intensive care unit graduates, better survival of cystic fibrosis and AIDS patients, as well as better organ transplant survival rates all contribute to a larger pool of younger patients at risk in the community.

Rapid laboratory confirmation is important in the management of the more severely ill patient to identify candidates for antiviral drug therapy. Rapid diagnostic tests using the sensitive and specific ELISA (enzyme linked immunoabsorbent assay) are appropriate. A PCR (polymerase chain reaction) test is also available. Confirmation by tissue culture or by serology takes longer; these are recommended for diagnostic

confirmation and public health surveillance. Results help to validate vaccine efficacy through demonstration of a good match between the vaccine strain and the epidemic strain, as well as to guide recommendations for antiviral prophylaxis or therapy on a community-wide basis.

Options for Influenza Control

Influenza Vaccine

Influenza vaccine is a trivalent killed virus vaccine, made from highly purified, egg-grown viruses, and incorporates antigens from two type A and one type B strain. An effective match between the vaccine strains and the circulating strain can prevent influenza illness in 70% of immunized healthy children and young adults, and reduce by 70% the need for hospitalization due to complications among the elderly, even though their titers may not be as high. To minimize febrile reactions, only subvirion or purified surface antigen vaccines, also called "split-virus" vaccines, should be used in children. Influenza vaccine is strongly recommended for anyone over 6 months old who is at increased risk of complications of influenza because of age or medical condition (Table 2).

Persons who are clinically or subclinically infected and who attend or live with members of high-risk groups can transmit influenza virus to them. Therefore, the following groups should be vaccinated:

- Physicians, nurses, and other personnel in both hospital and ambulatory care settings;
- Employees of nursing homes and chronic care facilities;
- Providers of home care to persons at

ABBREVIATIONS USED

AIDS: Acquired immune deficiency syndrome

ELISA: Enzyme-linked immunoabsorbent assay

PCR: Polymerase chain reaction

Utpala Bandy, MD, MPH, is with the Division of Disease Control, RI Department of Health, 3 Capitol Hill, Providence, RI 02908-5097; (401)2432.

Table 2.—Members of high-risk groups who should be targeted for organized vaccination programs

- Persons >65 years of age
- Residents of nursing homes and other chronic care facilities housing persons of any age with chronic medical conditions
- Adults and children with chronic disorders of the pulmonary or cardiovascular system, including children with asthma
- Adults and children who have required regular medical follow-up or hospitalization during the preceeding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression, regardless of cause
- Children (6 months–18 years) who are receiving long-term aspirin therapy and are therefore at risk of developing Reye's syndrome

high risk (eg, visiting nurses); and

- Household members (including children) of persons in high-risk groups.

Influenza vaccine is considered *safe for pregnant women*. Pregnant women who have health conditions that increase their risks for influenza-related complications should be vaccinated regardless of the stage of pregnancy.

A single dose of vaccine is recommended for adults and previously vaccinated children. Among previously unvaccinated children under 9 years old, two doses 1 month apart are recommended (Table 3). *Note that Pneumococcal vaccine may be given at a different site concurrent with influenza vaccine*

Adverse reactions to influenza vaccine are uncommon, the most common reactions being local erythema/tenderness and minor fever, malaise, and myalgia. Delayed hypersensitivity to thimerosal, characterized by a skin rash, tenderness, swelling and redness may occur. Anaphylaxis to residual egg protein has been documented; therefore, known prior anaphylaxis after egg ingestion is a contraindication to influenza vaccine use

Optimal timing for organized vaccination campaigns is usually between mid-October and mid-November, but the vaccine should be offered to appropriate individuals at every opportunity throughout the period in which influenza virus is circulating. Current recommendations *do not* include additional doses of influenza vaccine during the second half of the season. Physi-

cians' offices, walk-in-clinics, specialty care clinics, outpatient rehabilitation programs, dialysis centers, VNAs, acute care hospitals, and long-term care facilities should implement strategies to provide prophylaxis for high-risk clients throughout the period in which virus is circulating. Effective strategies combine education for health care workers, publicity targeted towards potential recipients, medical record review and recall, and efforts to remove any financial or administrative barriers that may prevent persons from receiving vaccine. Medicare part B will reimburse for influenza vaccination.

Chemoprophylaxis

The two antiviral agents amantadine hydrochloride and rimantadine hydrochloride interfere with the replication cycle of type A (but not type B) influenza viruses. The usual dose is 200 mg/day as a single or split dose. Side effects can be minimized by using 100 mg in elderly patients who tolerate these medications poorly. The dose for children is 5mg/kg/day divided into two doses to a maximum of 150 mg/day. Children older than 10 years should be treated with the adult dose. Both products can be used for chemoprophylaxis among high-risk persons and health-care workers who are vaccinated during the 2-week period after influenza activity has begun, or for the duration of the season if vaccine is contraindicated. Chemoprophylaxis is also useful in controlling institutional outbreaks, especially if the outbreak strain and vaccine strain do not match. Chemoprophylaxis may be used to protect severely immunodeficient individuals who are expected to have a poor

response to vaccine. Antiviral agents can also be used as treatment, to reduce the severity and shorten the duration of influenza illness, if started within the first 48 hours of onset and continued for 1 week. Note that rimantadine is approved for prophylaxis only and not for treatment in children younger than 18 years.

Rhode Island Surveillance

Surveillance activities to monitor the strain type as well as the intensity and progression of influenza activity are made possible through the efforts of a statewide network of 40 sentinel physicians who report weekly to the health department. From October 1993 to March 1994, only 388 cases of influenza-like illness were reported, compared to 2268 for the same period in the 1992–1993 season. The milder season was attributed to a combination of lingering herd immunity among the many who had the illness the previous year with an antigenically similar strain, and enhanced vaccine coverage (Medicare part B reimbursed vaccine-related costs for the first time). A single positive culture confirmed that the circulating strain was in fact influenza A and therefore validated a good match with the vaccine strain in 1993–1994. Sentinel physicians are encouraged to pursue cultures for surveillance purposes.

The efforts for prevention of influenza are shared by practicing physicians (including sentinel physicians), community organizations and health care facilities serving the elderly, laboratories, state public health officials, and the national influenza surveillance program of the Centers for Disease Control and Prevention.

Table 3.—Influenza vaccine¹ dosage, by age group, US, 1994–1995 season

Age group	Product ²	Dosage	No. doses	Routes ³
6–35 mos	Split virus only	0.25 mL	1 or 2 ⁴	IM
3–8 yrs	Split virus only	0.50 mL	1 or 2 ⁴	IM
9–12 yrs	Split virus only	0.50 mL	1	IM
>12 yrs	Whole or split virus	0.50 mL	1	IM

¹ Contains 15 ug each of A/Texas/36/91-like (H1N1), A/Shangdong/9/93-like (H3N2), and B/Panama/45/90-like hemagglutinin antigens in each 0.5 mL. Manufacturers include: Connaught Laboratories, Inc. (Fluzone[®] whole or split); Evans Medical Ltd. (distributed by Adams Laboratories, Inc.) (Fluvirion[™] purified surface antigen vaccine); Parke-Davis (Fluogen[®] split); and Wyeth-Ayerst Laboratories (Flushield[™] split). For further product information call Connaught, (800) 822-2463; Adams, (800) 932-1950; Parke-Davis, (800) 223-0432; Wyeth-Ayerst, (800) FLU-SHIELD.

² Because of the lower potential for causing febrile reactions, only split-virus vaccines should be used for children. They may be labelled as "split," "subviroin," or "purified-surface-antigen" vaccine. Immunogenicity and side effects of split- and whole-virus vaccines are similar among adults when vaccines are administered at the recommended dosage.

³ The recommended site of vaccination is the deltoid muscle for adults and older children. The preferred site for infants and young children is the anterolateral aspect of the thigh.

⁴ Two doses administered at least 1 month apart are recommended for children <9 years of age who are receiving influenza vaccine for the first time.

THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (November 1904)

The lead editorial decries the unreasoned prejudice against hospitals "for the insane" and pleads for a more understanding attitude. The editorial observes: "About the time the colonies of New England were founded, the mentally unsound were imprisoned and ill-treated as 'a displeasure to God and an annoyance to the King's subjects.' Vast as has been the strides made in the nearly 3 centuries of progress in psychiatry, it is surprising how ignorance and prejudice linger in the treatment of nervous and mental diseases. There clings to many of us still that instinct of the gregarious animals in obedience to which the stricken member of the herd was driven out to perish. How else shall the unreasoning prejudice against the hospital for the insane be explained, or the foolish dread of the patients it contains, and that for which it stands?" The writer further observes: "Soon, let us hope, there will be an end to the indiscriminate drug-giving by which the perplexed doctor marks time while he watches and waits and the nervous patient will be subjected at once to those conditions of hygiene, physical, mental and moral, that the disease demands as essential to its cure. All about us are reputable schools of health whose doors are open—and not alone to the well-to-do—to those who will but enter in season and learn wise ways of living."

A second editorial notes that many physicians are apathetic in the management of the business part of their profession. The editorial then goes on to list those accounting and billing procedures that the young practitioner must observe with regularity. The editorial ends: "Perhaps it is unfortunate that financial success in medicine is not always open to the scientific man. The art of tactfulness in dealing with the patient, with the family, with the laity generally, is to be

reckoned with. But in any event the doctor's work should be carefully recorded, his accounts promptly rendered, and judicious, sanely, firm means should be exercised in appropriating what is his due."

J. Howard Morgan, MD, of Westerly, describes a case of injury to the cervical portion of the spinal cord with postmortem examination. The patient was a 55-year-old male carpenter who had been thrown down from the second floor of a building. No obvious fractures were found by the examining physician. About an hour later the patient described numbness in his hands. During the succeeding 10 days clear evidence of spinal cord injury became evident, including hyperreflexia. A postmortem examination disclosed fractures of the 4th and 5th cervical laminae. A faint bluish discoloration was noted involving the upper cervical enlargement. Transverse sections disclosed an extensive, dissecting hemorrhage extending down to the thoracic segments.

V.L. Raia, MD, of Providence describes 7 cases of eyeball injury. They include instances of corneal wound without perforation; eyeball contusion with scleral rupture; punctured wound of the cornea, lense and retina; contusion of the eye caused by obstetrical forceps; infected corneal ulcer by a foreign body; and penetrating wound with retention of a foreign body. The author emphasizes that even small corneal abrasions should be respected and cared for properly since they "... may be the starting point of a severe infection producing supuration of the whole organ (panophthalmitis) and that when sympathetic symptoms have begun in the sound eye even enucleation of the affected one cannot arrest them."

50 Years Ago (November 1944)

George Waterman, MD, discusses the epidemiology, classification, pathological grading, and therapeutic

results (with 5-year survival rates) of carcinoma of the endometrium. This retrospective study is based upon 140 cases from the Tumor Clinic of the Rhode Island Hospital.

Hemolytic disease of the newborn (erythroblastosis foetalis) in one of twins is described by Maurice Adelman, MD. The mother, aged 35, had previously been delivered of a normal male infant. She had never previously been transfused. She was then delivered of twins, one male and one female.

The mother and the male infant did well but the female infant was drowsy, and slightly jaundiced. By 48 hours there was hepatosplenomegaly and a severe macrocytic anemia with numerous nucleated erythrocytes. On the 13th day, the spleen was removed and since then the infant did well. Pathologic examination of the spleen confirmed the clinical impression of erythroblastosis. The mother was Rh+ while the father was Rh-. The twin son was RH- while his female sibling was Rh+.

Editorials in this issue of the journal include discussions of a new Blue Triangle plan to pay for dental bills; some fragments of medical history in early 19th century Rhode Island; a plea to recognize that the nation is still at war despite great victories in Europe; a discussion of misuse of the term "doctor"; and a brief note on the celebration of Horace Wells, the Connecticut dentist who first used nitrous oxide as anesthesia.

25 Years Ago (November 1969)

F.A. Simeone, MD, discusses the surgeon's role in the evolution and management of diseases brought to light by the conquest of old ones. The bulk of the paper dwells upon the evolution of the various shock syndromes, the research that led to insights into these states, and the practi-

cal applications of such insights in the treatment of war injuries, particularly those injuries associated with blood loss and traumatic shock.

Percutaneous radio frequency cervical cordotomy is described by Robert H. Sturman, MD. The procedure of anterolateral cordotomy for the alleviation of intractable pain has been used since 1912. In 1963 a technique was devised involving the insertion of a radioactive needle into the high cervical spinal canal next to the spinothalamic tract. The author, using a modified radio-frequency procedure, describes his experience in 31 patients. Most of these patients (25 of 31) suffered from pain secondary to metastatic carcinoma. The author concludes: "80% of these patients, whether subjected to unilateral, bilateral, or repeated procedures, obtained relief from pain, indicating the usefulness of the procedure, especially in the debilitated patient. The lower anterior cervical approach has proved in our hands to be safer and less complicated by untoward side effects than the high cervical approach."

Harry Savitz, MD, describes the close and enduring friendship between Sir Moses Montefiore, the great British philanthropist, and Dr Thomas Hodgkin, the Guy's Hospital physician immortalized by the lymphomatous disease that bears his name.

The journal provides the readership with a detailed report concerning rubella vaccination.

The report of the ad hoc committee of the Medical Society looking into the relationship between osteopathic and allopathic physicians is presented, along with the committee's recommendations concerning eligibility for hospital and other appointments.

Editorial subjects include length of stay in teaching hospitals; magnetic crystals; an inter-industry aerosol committee; and interferon.

Robert V. Lewis, MD, favorably (and eruditely) reviews a new piece of fiction, written by a young physician named Michael Crichton, called *The Andromeda Strain*.

A statistical compilation of health work force in Rhode Island is provided by the RI Health Department. The report notes that there are 138.2 physicians per 100,000 population in Rhode Island; compared nationally with 153.1 physicians. The average age of the Rhode Island physicians is 50.3 years.

BOOK REVIEW

Death and Dignity. Making Choices and Taking Charge. Timothy E. Quill, MD. New York-London: WW Norton & Company; 1993. 255 pp. Paperback-\$10.95.

This is an exceptional book that stands out in a crowd. Why?

Because, in a universe replete with technology-driven informational overload and with data-rich and concept-poor research, it is not too hard to realize that people look for easily understood, simple solutions to difficult problems. These are being eagerly provided by profitable multi-million dollar industries, purveying even more overload by way of an endless proliferation of print: self-help, how-to-do treatises or booklets, proceeding from simplistic assumptions to the promise of foolproof remedies. Theories are rooted in honest, painstaking study or represent narrow-minded, aggressive dogma, many with less than convincing conclusions. The authors run the gamut from outright charlatans to concerned humanists and everything in between. The din, even in the age of rock and roll, is deafening. And confusing.

When it comes to matters going to our core, to health and illness, life and death, this situation can have disturbing consequences. How do you find your way through the multitude of voices, some earnestly and discriminately proposing tentative answers, others proclaiming infallible truth?

How to face the inevitable terminal moment of life is perhaps the most challenging, searing and searching question put to us all. Complicated, for better and worse, by developing medical technology, it has become the subject of passionate controversy in scientific and philosophical literature, in public life, as well as in the media and everyday conversation. To die with dignity, the topic of the book under review, to die in your own surroundings, amidst familiar faces and comfort-givers, has become the rarest of opportunities. Besides dying in battle, or on a street corner by a stray bullet, most people in developed societies succumb in an institution. And this is where the choices of options, the proliferation of advice and exhortation, are often forbidding. Everyone has been weighing in. From the AMA and other organized religion, from the Hastings Center and Governor Lamm to the Final Exit and Dr Kevorkian, and in a recent

thoughtful issue of this journal,¹ a plethora of strong opinions give you the proponents' preference, ultimately leaving you, as you must, to decide on your own. Many of us, as human beings and as physicians, may neither have the fortitude nor sufficient knowledge to make the decision.

Here is where this recently published volume comes in, an extraordinary exception to the quandary outlined above. Here is where a physician of deep and courageous humanity and of impeccable expertise does not offer advice. Instead, he offers balanced guidance, presents a lucid, extremely thorough guide through the thicket of clinical, emotional, ethical, public policy and legal dilemmas you are faced with at the moment when only you can determine how you would like, or would like to help one of your patients, to die. Modestly, with profoundly moving honesty, Dr Quill tells his story, first published in the *New England Journal of Medicine*.² The present short book elaborates on it, simply and clearly written in readable type, in more detail than the space allotted to a review allows. I venture to say that every physician, as a person and as a professional, will find gratifying reward from cover to cover: in case histories and personal experiences, illustrations and examples of and criteria for desirable and undesirable treatment,³ chapters on comfort care, on counterproductive public policy and media reporting, on advance directives. All buttressed by an extensive and scholarly selective bibliography.

Dr Timothy Quill, associate professor of medicine and psychiatry (a felicitous combination!) at the University of Rochester School of Medicine and Dentistry, is owed a debt of gratitude by many present and future patients and their physicians—that means all of us—a debt the magnitude of which will become apparent only when it will be commonplace what he so selflessly has pioneered.

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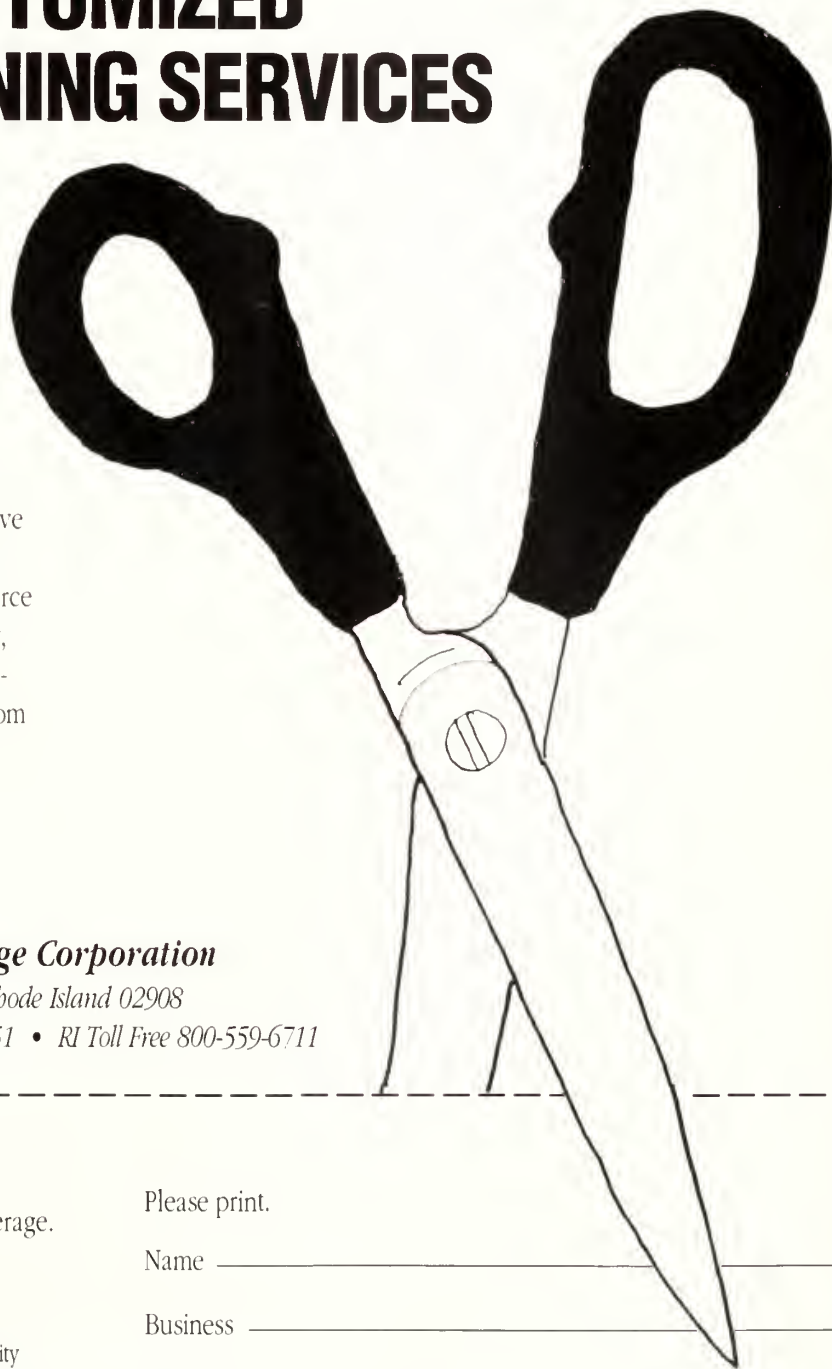
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Rhode Island **MEDICINE**

December 1994

Volume 77, Number 12



Women's Health





JUST BECAUSE EVERYONE IN THE STATE NEEDS WORKERS' COMPENSATION COVERAGE, DOESN'T MEAN THAT YOU HAVE TO GO TO JUST ANYONE IN THE STATE TO GET IT.

Notice to all physicians: mandatory Workers' Compensation Insurance. Every business in Rhode Island with four or more employees, full or part-time, is now required to have Workers' Compensation Insurance, predominately with one carrier. This means that those private practices without coverage will need to get it, and those with an alternative source of Workers' Compensation will need to switch at time of renewal. Because the RI Department of Labor is now enforcing this legislation with on-site inspections and the possibility of fines or worse – we at RIMS IBC would like to encourage you to contact us immediately. After all, what better partner to guide you through the intricacies of Workers' Compensation Coverage than your healthcare insurance professionals at IBC.

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Cover: Etching, by Albrecht Durer, of his mother.

Butler Hospital Celebrates Its 150th Anniversary

Walking on one of the beautiful, tree-lined sidewalks that wind through Butler Hospital's 110-acre campus, it is easy to imagine earlier generations walking past the same elegant brick buildings. A good deal of thought went into the hospital's design and construction. The goal was to enhance treatment by creating a safe and pleasant environment for patients. This combination proved so successful that, 150 years later, Butler Hospital continues to be the main facility in the area for the treatment of the mentally ill.

Looking Back—the 19th Century

Founded in 1844, Butler is the oldest hospital in Rhode Island and one of the oldest psychiatric facilities in the US. The hospital's campus was originally purchased with funds left by Nicholas Brown. Cyrus Butler (after whom the hospital was named) and other local citizens, many of whom each donated a dollar, raised the additional funds to construct the first buildings.

The hospital was fortunate in hiring Dr Isaac Ray to be its first superintendent. He would distinguish himself as one of the leaders of a fledgling movement in the US, known as Moral Treatment, which stressed the importance of humane and ordered care of the mentally ill. His assumption was that the environment the mind confronts can be a curative agent. Dr Ray also believed that the mentally ill should be afforded the same level of care and legal rights as other citizens. He was critical of the lack of understanding and empirical data concerning mental illness and contributed to the beginnings of an organized body of knowledge based on facts and information rather than superstition and stigma.

The hospital's goal was to treat patients with dignity and respect, a new, perhaps radical, philosophy for that time. But it formed a lasting basis for the hospital's mission to the community.

Dr Ray's writings and lectures earned him much respect and acclaim throughout the country and, in the same year as Butler's founding, he joined with other superintendents from other psychiatric hospitals and founded the American Psychiatric Association. He later became its fourth president.

New Developments—the 20th Century

In the first decades of the 20th century, two developments changed psychiatrists' thinking about the effects of environment. The pioneering work of Sigmund Freud and Harry Stack Sullivan forced psychiatrists to consider psychological and social causes of



Butler Hospital at the turn of the century (left). Below, the main entrance to Butler Hospital, 1994.

mental illness. During World War I, military doctors became aware again of the influence of environment on patients. The doctors realized that both psychological distress and environmental conditions had triggered mental illness and tried to provide an environment that could relieve the stress and give their patients a feeling of safety.

As a result of research in the interwar, and post-World War II periods, mental health professionals began to view mental illness as a product of interacting factors: social, psychological and physiological. In the mid-20th century as in the mid-19th, the importance of the hospital environment as a curative agent was recognized and accepted. This new concept was first called milieu therapy and later, social psychiatry. In the 1950s and 1960s Butler Hospital embraced milieu therapy as a positive approach to treatment. At the same time, the first medications were coming into use. Lengths of stay dropped dramatically.

Today and Beyond—the 21st Century

While it is proud of its history the hospital has remained at the forefront of new developments in psychiatry including:

- Opening one of the first outpatient programs in the late 1950s. In 1993 this program had more than 26,000 visits.
- Developing the first partial hospital treatment program in the country to be funded by Blue Cross in the early 1970s.
- Pioneering effective, short-term, managed-care treatment programs in the late 1980s. Today, its average length of stay (8 days) is well below the national average.
- Working with the state's department of mental health and the eight community



mental health centers to provide acute services for people in the state system.

- Supporting the local efforts of the Alliance for the Mentally Ill and the Depressive and Manic-Depressive Association to fight stigma and improve service delivery.

On September 27, 1994, three psychiatrists considered to be the most influential in shaping "modern" psychiatry over the past 25 years came to Butler Hospital to receive the first Isaac Ray Decade of Excellence Award and to mark the hospital's sesquicentennial. Also, a public forum was held to discuss the future of mental health care. The awards program and forum was co-sponsored with the Brown University School of Medicine's Department of Psychiatry and Human Behavior.

The two programs attracted nearly 300 people. The audience included treatment professionals from the hospital's inpatient, partial hospital and outpatient programs; community mental health professionals; insurers, teachers, students, advocates, patients and family members. Each one was a symbol of how far mental health care has come, and of the hope for continued advancements in the field. Certainly, Butler Hospital intends to continue to be a part of those advancements.



Seize the Moment

As the articles in this issue of RHODE ISLAND MEDICINE document, women have distinct, gender-based health care needs. With the notable exception of reproductive health issues, however, many of the distinct health care needs of women have been largely neglected in medical research and practice. Even a cursory review of the papers in this issue reveals the pervasiveness of this problem. Our authors appear to believe that nothing less than a comprehensive, systemic approach to treatment will effect a cure. I concur.

The promotion of women's health represents a commitment to women *throughout the life cycle*, including the last third of life, in which we should strive to assure optimal health, ambulation, and independence. This commitment must be multi-dimensional and multi-disciplinary, with contributions from public health, education, and social services, as well as from the medical community.

Sensitizing young medical students to the unique health care issues of women throughout the life cycle is critical for the prevention of morbidity and mortality among all women. It was thus with considerable interest that I recently re-read "An Educational Blueprint for the Brown University School of Medicine." The blueprint represents a systemic change in the way we will think about medical research and practice in this state, and thus is key, in my opinion, to a fresh approach to women's health. The blueprint recognizes the importance of diversity in our approaches to medicine across the life cycle, social class, and culture, and contains elements of change in our basic approach to women's health.

The blueprint, if used appropriately, may serve to cement the building blocks of women's health in Rhode Island: our fine, long-standing tradition of obstetrics and gynecology, the Office of Women in Medicine, a women's health fellowship, the Women's Health Initiative, and the ground-swell of

support for programs that address women's health, such as women's cancer screening programs. The blueprint, however, is just that: a blueprint. Its authors describe it as "a foundation of a competency-based curriculum for the medical school," a "core" upon which a comprehensive curriculum is built. It was written with intentional breadth, allowing "wide latitude by the instructor in the selection of specific content."

I see the blueprint as a marvelous opportunity for all of us who are interested in promoting women's health through medical education (on all levels, from medical

In this joyous season of Christmas, the solstice and Channukah, the editors and publications committee of RHODE ISLAND MEDICINE raise their voices—and their cups of wassail in toasting our many professional colleagues. We wish each of you a relaxed and safe holiday season. May the year ahead bring each of you good health, good learning, and equanimity.

school, through residency and fellowship training, to continuing medical education). The blueprint, of course, is not the only vehicle for the promotion of women's health. For example, the public health community in this state is striving to promote women's health with programs for the prevention and cessation of tobacco use, women's cancer screening, the prevention of falls in older women, and the prevention of communicable diseases, such as AIDS and tuberculosis. Nonetheless, drawing the blueprint has stimulated considerable thought about health, health care, and medical education, and has thus prepared us for change. It has given us permission to rethink old concepts and consider new ones.

We must seize the moment. Using the blueprint as a foundation from which to

work, we need a clear and compelling vision for women's health in medical education, and organized leadership to assure that women's health issues be addressed fully in the curriculum, even at a time when the medical community is debating just *how* to do so. That's okay. Let us bring the debate to Rhode Island. Let us use the energy the blueprint has generated to address the issues. The alternative, to allow women's health to be relegated again to the backwaters of our educational priorities, would be a terrible mistake, the more terrible because we could have avoided it.

Barbara A. DeBuono, MD, MPH

The Soul of Dover

Physicians come in all sizes, levels of competency and degrees of flamboyance. Yet rarely has the healing profession found within its midst the outrageous and truculent likes of Thomas Dover. How many physicians have been called—and accurately so—a South Seas pirate, a merchant adventurer, a writer of enduring medical texts for the laity, a slaver, a hugely successful practitioner—and even the savior of the marooned Robinson Crusoe?

Dover was born west of London in the unsettled year of 1662, descending from a line of distinguished but frequently rebellious lawyers. He attended Oxford, later transferring to Cambridge to complete his medical studies. While serving a clinical apprenticeship with the renowned Thomas Sydenham, Dover developed small pox. His treatment was personally supervised by Sydenham, and according to his detailed diary, consisted of 22 ounces of blood-letting, confinement to an unheated room without blankets, and a daily diet restricted to 12 bottles of beer mixed with spirits of vitriol. Dover nevertheless underwent an uncomplicated recovery and continued to Bristol to establish a successful practice.

In the early years of the 18th century the

port of Bristol prospered as the commercial base for the triangular slave and commodity trade embracing West Africa, the Caribbean and England. Impressed with the potential profits in maritime investment, Dover abandoned his land-based practice and embarked upon a dual career as ship's co-owner and shipboard doctor.

By 1708, Dover had garnered sufficient navigational experience to captain his own vessel; and prompted by access to still greater profits, he joined the fraternity of British privateers attacking Spanish shipping off the western coast of South America. Under his command, a fleet of British galleons successfully raided and plundered the Pacific port of Guayaquil, then under Spanish control. During January 1709, Dover's ship tracked up the west coast of South America seeking further Spanish targets. Many in the crew were showing signs of early scurvy and Dover elected then to take a small pinnace ashore to Juan Fernandez Island to locate fresh fruit and vegetables. To Dover's surprise he met a 33-year-old bearded sailor in shabby goatskins named Alexander Selkirk who had been cast upon this desolate island some 4 years previously. Selkirk had earlier run away from Scotland because of charges relating to his "indecent behavior in church" and had escaped to sea in a privateer. Following a dispute with his captain he had been abandoned upon this remote island west of Chile. Selkirk was finally returned to England in October 1711 and after a shoreside interval, returned to sea where he died in 1721. Before resuming his maritime career, however, he shared the details of his extraordinary adventures with a political satirist and writer of non-conformist pamphlets, one Daniel Defoe. Selkirk also transferred his private notes to Defoe who in 1719 published a "tale of occidental man confronting raw nature" in the imperishable classic of fiction called "The Life and Strange Surprising Adventures of Robinson Crusoe."

When Dover returned to England he became intimately involved in the financial adventures of both the East India and South Seas Shipping companies. One grandiose scheme involved a confrontation with Spanish authority through the smuggling of slaves and British fabrics to the River Platte area of South America in exchange for precious quinine bark and cowhides. Dover was chosen to preside over this risky enterprise. He embarked upon his voyage accompanied by a personal entourage of 12 African ser-

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By THOMAS DOVER, M.B.

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vants, as well as secretaries and personal concubines; he ultimately established his headquarters in the town of Buenos Aires. Dover's diaries indicate that his stay in South America was tempestuous, punctuat-

ed by numerous epidemics that required his medical skills. He apparently also took liberties with his commercial stewardship and the London-based owners fired him for "breach of instructions and neglect of duty."

An uncontrite Dover returned to London with undiminished pugnacity, still a wealthy man. The precipitous collapse of the South Seas Company a short time later led to heavy financial losses and Dover was then obliged to resume his practice of medicine. Within months, however, he was again in trouble. His lack of diplomatic skills and his ill-tempered behavior, more befitting a quarter-deck than a consultation room, incurred the wrath of local physicians and apothecaries, and he was severely censured for his "transgressions." His practice, nevertheless, prospered and because of his emphasis on the therapeutic use of elemental mercury, sometimes called *Eathiops mineralis*, he became known as the Quicksilver Doctor.

In 1733 the eminent English actor Barton Booth sought Dover's counsel because of a debilitating, remitting fever. With characteristic arrogance Dover assured Booth that crude mercury would be his salvation. He was given about two pounds of liquid mercury, orally, and Booth promptly died within days. An autopsy, incidentally, revealed the probable cause of Booth's difficulties: chronic obstructive gall-bladder disease.

The death of his wife, further financial reverses, widely publicized clinical failures such as the Booth case, and accumulating fatigue forced Dover to yield his London practice. Near bankrupt, he returned to Bris-

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tol where he established a small medical office. Most of his energies, however, were now invested in assembling a medical book for the laity—an unheard of enterprise at a time when literacy was not widespread and popularization of medical procedures was considered a breach of professional ethics. (The Statutes of Morality of the London College of Physicians stated categorically that: "A Physician may not instruct the People in Medicines, or discover to them even the names of any Medicines, especially of those of the more violent Kind, such as Purgings, Opiates, Narcotics, Abortifs, Emetics, or any other Medicines of Moment and Danger.") The book was published under the name 'The Ancient Physician's Legacy to his Country' and was an immense success. Dover, now 70, maintained his practice for another decade while periodically issuing intemperate pamphlets in response to "the malice of my most implacable enemies." He died quietly in 1742.

Dover's text deserves careful reading. It is a curious mixture of common sense, lucid writing, and intelligent advice marinated, though, with equal parts of arrogant impatience, reckless hyperbole and paranoia. It certainly lacks the customary humility and rote apology of most 18th century texts; over half of the book consists of uncritical letters of congratulation and commentaries deploring the "perniciousness and ineptitudes" of his colleagues. He frequently assumes the role of the maligned victim, as in this passage: "It is a very great Hardship, that I must be subject to the Caprice of every Pretender to Physick: If I have already prescribed any Thing that is dangerous to Mankind, let the College of Physicians call me to an Account for it."

Some of Dover's formulations, missing only incantations, would provoke the envy of Macbeth's witches. Consider the following therapy for kidney stones:

"I prescribe the inmost Coat of the Giz-

zards of Pidgeons finely powder'd, to be taken Night and Morning, one Scruple in a glass of White-Wine; But you may please to try one ounce of Quicksilver every morning for a month. I have known this do wonders. Clysters often afford some Relief, as Turpentine opened with the Yolk of an Egg, and Urine added to it." For infertility, "The Indians at the Malucco Islands and the Ladies at Smyrna, often take Quicksilver as a remedy against Barrenness. An ounce may be taken once a Day for a Month or two, which will prove an extraordinary Remedy." And for scrofula, a sorcerous brew of senna, monk's rhubarb, dock, polypody roots, mizerion, rue, whitlow grass, orange rinds, and crude antimony; and, of course, the singular *mercurius dulcis* twice a week. Some, perhaps many, of Dover's patients recovered. It may remain a mystery why

they recovered, but not all mysteries are necessarily miracles. Except for his attachment to mercury, Dover was nevertheless considered a therapeutic nihilist; and it is quite likely that the prescriptions of his contemporaries far exceeded even his in bizarre complexity.

One of Dover's medicinal concoctions that has endured for centuries, a mixture called Dover's Powders (*pulvis ipecacuanhae et opii*), is still prescribed occasionally as a diaphoretic. Its composition has varied from Dover's original formula but it is essentially a mixture of opium, ipecac and some potassium salts.

It is said that they don't make many like Thomas Dover; and for the stability of medicine this is perhaps fortunate.

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A History of Women's Health Care

Joanne F. Liutkus, MSW, MD, and Karen Rosene Montella, MD

Women's health is in vogue as a "new" specialty in medicine. Why is this happening now? The history of women's health care has been one of neglect and indifference by the traditional medical and funding establishments. What events have led to this new-found interest?

The history of women's struggle for recognition, inside and outside of health care, is a fascinating one, punctuated with occasional exaltation, frequent repression, and, sometimes, even death. Through the centuries, the status of women in health care has changed from one of respect, through persecution, to acceptance. Two separate but related themes have been present throughout this history: women striving for positions of power as doctors and nurses, and women striving for power over their bodies and health care choices.

The next few pages will summarize this history. Societal attitudes toward women as patients and providers will be traced through time. The development of women's health organizations and their influence on health care policy will be discussed, as will those forces that are currently shaping women's health policy. Existing concerns about the historical control of policy will be addressed.

The summary is inadequate to do justice to the many women and men whose courage and determination have made the current state of affairs possible: for women's health care to be recognized as an important concern, and for women to begin to attain positions of power within medicine.

Women & Health in the Middle Ages

Aristotle and Hippocrates are respected in scientific and medical thought, but who are Trotula and Hildegard of Bingen? Fre-

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quently it was assumed that women's contributions to medicine and science did not exist when women actually have played essential roles as keepers of medical knowledge, guarding it and passing it on to their daughters and other women. In her book, *Woman As Healer*,¹ Jeanne Achterberg, PhD, chronicles the roles women have played as healers from the dawn of history to the present day. Trotula of Italy is described as a distinguished teacher who wrote "... the world's most enduring treatise on gynecology and obstetrics." She is said to have founded an institution for medical practitioners around 1000 in Salerno, Italy, which continued to function until 1811. She was a skilled diagnostician and healer who knew how to treat vulvar abscess and uterine prolapse with success. Trotula worked as a true generalist, writing beauty prescriptions, using opiates for pain and other medications commonly used today. She is thought to be the first to write on the dermatological manifestations of syphilis. Trotula advocated the need for personal hygiene in the general public and by surgeons with their patients. However, she was removed from written history in the early 1800s, her work attributed to male practitioners, and her existence held in question.

It was increasingly recognized that the social and psychological factors in a woman's life affect her physical health, and that these issues need to be acknowledged by the medical profession.

Another such woman was Hildegard of Bingen, born in Germany in 1098, who rose to become the Abbess of Rupertsburg around 1151. She was a musician, artist, pharmacist, physician, and theologian, and has been described as "the most profound scientist of her time."¹ She is credited with having written one of the first major medical texts, entitled *Causae et Curae*, and her medical writings have been considered the most important scientific contributions of her time.² She was one of the few women allowed to publish her works and was sought to advise women and men alike, including those in the upper echelons of the Church. Trotula and Hildegard were women who

Women physicians gravitated to the specialties of obstetrics, gynecology, pediatrics, public health, teaching and counseling. Whether this was because of discrimination or because of their "special abilities" is a matter of debate.

were allowed to apply their intelligence to medical thought freely. They are examples of individual women whose achievement served the general public.

Other women, now nameless, are thought to have worked within their communities and practiced midwifery, surgery and pharmacology. Men were not permitted to enter a room where a woman was in labor. Women turned to each other with problems of health and disease: fertility, contraception, abortion, illness, and for palliative care. This collective interest of women for the health of their neighbors is a common theme through most of history, but has been accepted and supported only intermittently.

The 14th to 17th Centuries

Rigid Christian theology began to find a wider audience, infiltrating political and educational systems, and was to become the death knell for women healers. The European witch hunts of the 14th to 17th centuries were acts of widespread terrorism against women, sanctioned by the Church and courts, encouraged by fear and ignorance in the general population. During this holocaust, many were murdered, mainly women and children.³ Their crimes included practicing the art and science of healing.

The *Malleus Maleficarum*, the official document of the witch hunts, was written in 1484 by Reverends Kramer and Sprenger and stated, "No one does more harm to the Catholic Church than midwives."³ Midwives were equated with witches and those who practiced their trade were routinely put to death. Midwifery was outlawed and women were forced to assist each other during childbirth in secrecy, risking death if discovered. The church doctrine declared "if a woman dare to cure without having studied, she is a witch and must die,"¹ but women were not permitted (and could not afford) to study medicine, then considered a male privilege. Since a woman's healing powers were based on the knowledge of generations and clinical experience rather than formal education, she was held suspect and thought to be practicing magic, the work of the devil.

Women who practiced the healing arts were often peasant women who treated their own people for diseases stemming from poverty, oppression, and poor working con-

ditions. They nursed and doctored their patients, incorporating caring with treatment. The women who provided health care were as powerless as their patients and usually did not have access to alternative resources. Male physicians were often unavailable to the poor. The church taught the poor that sickness was God's affliction on the sinner, and to suffer now meant less suffering after death.

The 1800s

The industrial age was well under way in Europe and North America. Medical schools, which restricted admission to white men only, gained popularity. Women struggled for admission to medical schools or turned to nursing, where they were expected to carry out physicians' orders and rarely to think for themselves.

Several women attempted to attend medical school in the 1800s, the most noteworthy being Elizabeth Blackwell (1847). She was accepted by Geneva Medical College in upstate New York because of a misunderstanding between the college administration and the medical student body. The administration, opposed to the admission of a woman, approached the class and presented a proposal for her admission to the students, which they presumed would be rejected. The students agreed to her admission, it seems, because no one believed that she would actually attend. She did attend and graduated in the top of her class, but was not able to secure residency training in the US.¹ Thereafter, Geneva Medical College ceased to admit women.

... non-professional women across the country began voicing discontent with the absence of research on specific women's health care problems.

Other women followed Dr Blackwell's example, however. In 1850, the Woman's Medical College of Pennsylvania was formed. In 1868, Dr Blackwell and her sister opened the Women's Medical College of the New York Infirmary. By 1880, several medical schools accepted women on a regular basis, and by the 1900s, women numbered 4% to 5% of all physicians. This figure was thought to have remained stable until the 1960s.⁴

It was during this time that the thread connecting individual women as physicians with the improvement of women's health was developed. In 1859 Dr Emmeline Cleveland, a gynecological surgeon, "... affirmed the necessity of giving all women

knowledge of the human body."⁴ Maria Zakrzewska, founder of the New England Hospital for Women and Children in Boston, advanced the principle of doing no harm, cautiously using medicine while teaching patients preventive hygiene. Women physicians became known as the "... 'connecting link' between medical science and the everyday life of women."⁵ Medical knowledge was encouraged as a means of making women better mothers.

Women physicians gravitated to the specialties of obstetrics, gynecology, pediatrics, public health, teaching, and counseling. Whether this was because of discrimination or because of their "special abilities" is a matter of debate.⁴ Regardless, women physicians' concern for the health of women and children was significant, providing a foundation for the improvement of women's health and for recent developments in women's health care.

Women and Health in the 20th Century

Throughout the 1800s and most of the 1900s, society was slow to accept positive changes for women. The late 20th century, however, has been a time of great advancement for women (as well as a time of accelerated advancement in science and technology). In a century punctuated by two world wars and many regional wars, women's roles in the work place and in politics widened. By the 1960s women demanded to be heard. Feminist theory found an eager audience. Women spoke to and heard each other, broadening their concerns to include many societal problems. They discussed female anatomy, marriage, violence in relationships, orgasm, childbearing, sexual assault, incest, and many other topics affecting their everyday lives. Regarding the workplace, they discussed sexual harassment on the job, equal pay for work of equal value, job advancement, and educational opportunities.

In the 1970s, the popular health care movement was born of women's disillusionment with the techniques and drugs of "regular" physicians,¹ who often attributed women's health problems to emotional rather than physical etiology, and dismissed them. The strong influence of Freudian theory in medicine had framed women as hysterical and not necessarily believable. The reality of women's lives was dismissed as fantasy. With their sanity questioned, women grew to realize that they must assume a role in influencing the process of health care. Women found allies in nursing and social work, and among community activists, politicians, and some physicians. Their

disillusionment with the medical profession grew. Its inability to understand or respond to women's real and everyday needs became increasingly evident.

Women with varying philosophies and from all backgrounds organized for change. They were able to lobby political groups for action to end the traditional restrictions on their personal and professional advancement. Women's groups identified and publicized violence against women inside and outside the home, job discrimination, sexual harassment in the workplace, sexual abuse of female patients by male physicians, and the effects of a negative portrayal of women in the media. Physicians, often female, began working within their practices to improve the health status of female patients through supportive counseling and referral to appropriate therapy centers. Increasingly, it was recognized that the social and psychological factors in a woman's life affect her physical health, and that these issues need to be acknowledged by the medical profession. Physical health, the effects of sexism, and issues of personal safety became women's health care issues.

Menopause, breast cancer, osteoporosis, gynecological cancers, complications of pregnancy, infertility, birth control, abortion services, and violence against women are women's health care concerns that have existed for centuries.

There has been, and probably still exists, an assumption by the general public that North American medicine is gender neutral. However, there is clear evidence that discrimination against women exists in research, clinical practice and academia. Women have been excluded routinely from large-scale clinical trials, the most noteworthy being those that identified risk factors for coronary artery disease. Medicare is under scrutiny for providing better coverage for diseases more prevalent in men than for diseases specific to women,⁶ the more especially because women use health care services more frequently than men.⁷ Diagnostic and therapeutic interventions are more likely to be offered to men.⁸ In universities, few women hold top positions in medical and scientific research.⁹ Women's health care research has been underfunded consistently, women have not been recruited as subjects in important clinical research projects, and the special needs of women of color, disabled women, lesbian women, pregnant women, and older women have

not been included in statistical analyses.

Omissions like these have precipitated several actions. In February 1990, the Society for the Advancement of Women's Health Research was established with support from the American College of Obstetricians and Gynecologists, the American Psychiatric Association, and the American Nurses Association. In June 1990 hearings began before Congressman Henry Waxman's Subcommittee on Health and the Environment regarding the National Institutes of Health's (NIH) procedures concerning women and clinical research. Because women were not being included in study populations or in the statistical analysis of results, the NIH established an Office of Research on Women's Health and declared that women and minorities must be included in all clinical trials or that a justification must be made for their exclusion.¹⁰ Dr Ruth Kirschstein was appointed temporary director. On Capitol Hill, the Women's Health Equity Act was introduced, focusing on women's health care, treatment, and research.

In 1991, a woman became director of the NIH, and the Women's Health Initiative, a multi-center, multidisciplinary study on women's health, was announced. During the same year, the Society for the Advancement of Women's Health Research initiated proceedings on women's health research, incorporating comments from 25 representatives of various medical specialties, with discussion focusing on those areas especially in need of expanded research. Later that year, they co-sponsored a conference with the Center for Research on Women and Gender of the University of Illinois, Chicago, entitled "Women's Health Research: Opportunities and Strategies for Change." The goal of the society is now "... to see that appropriate research efforts are undertaken and that women's health needs are given the necessary priority by public and private research."⁹

Concurrent with these actions by the professional communities, non-professional women across the country began voicing discontent with the absence of research on specific women's health care problems. Breast cancer has been a long-time killer of women, but little progress has been made towards finding a cure. Women have begun to lobby for the allocation of increased funding for breast cancer research, and women and their families have organized to conduct public fund-raising.

Women have also begun to assume individual responsibility for their health care. They request female physicians, improved access to care, and safer drugs and medical devices. They seek better methods of birth

control and free access to abortion services. They seek birthing centers and control over the birthing process. They also demand freedom from physical and sexual assault by partners, strangers and physicians.

Towards the 21st Century

Progress in women's health and the role of women in health care has been slow and is not complete. Our society still does not value women or women's work as much as men and men's work. Menopause, breast cancer, osteoporosis, gynecological cancers, complications of pregnancy, infertility, birth control, abortion services, and violence against women are women's health care concerns that have existed for centuries. Although they receive more attention at present, we still need major research dollars to fill knowledge gaps. Medical students and residents are still not being taught women's health care issues as a part of their regular curriculum. Universities have been responsible for discouraging women's advancement in medicine, and the number of women in top positions throughout North America is still minimal. Financial support for women's studies programs is still inadequate. A higher value is assigned to research and the ability to win grants than teaching and advising in tenure decisions.¹¹ Few positive role models exist for women in academia. Many female faculty members who have achieved higher levels have done so at the expense of family. Some credit their success to rugged individualism, neglecting the debt they owe women who have come before them.

It would be naïve to think that the so-called "new" specialty of women's health and the motivation behind funding for women's research and programs is based on altruism. Our history tells a different story. The suffering of the past has inflicted wounds that will be slow to heal and never forgotten. There are those within the system who do not care for women's collective interests, but rather see this as an opportunity to advance their careers, or to establish a niche for themselves in a "new" specialty. There is no guarantee that women's concerns will continue to be heard or that women will be treated humanely and ethically within research studies. There is no guarantee that further research or the development of health care services for women will be woman-influenced and woman-directed. The feminization of medicine in North America is occurring at a time when health care spending is under restraint. Will women be the first to be sacrificed in an era of fiscal restraint? Are more women being allowed into medicine because of impending health

care reform, where physician's fees will be reduced? Will it be acceptable to pay women less, thereby reducing financial burden on the state? Are women's groups finally being heard because they represent a larger portion of the general voting public, and with aging, an even greater portion? Are people interested in working in women's health care to address the needs of women?

In summary, women's health is nothing new. For centuries, women have striven to treat the sick, to prevent illness, and to find new ways of fighting disease. Women have been persecuted individually and collectively for their involvement in, and need for traditional and non-traditional medicine, and continue to be. Although the pendulum has again swung in favor of women, patients and providers must remember their history and be vigilant, to prevent control and credit for women's health care from falling into the hands of opportunists or reactionaries. The medical community must remain aware of how women's health has been trivialized in the past, so that gains are not discredited or lost. This may prove to be a daunting task, yet one that must be faced by anyone concerned with women's health care.

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Women and the Risk of Cancer: Guidelines for Screening

Elaine Carlson, MD, and Barbara Schepps, MD

American women will bear the burden of an estimated 576,000 new cases of cancer in 1994. About 255,000 women will die of malignant disease in this country. In Rhode Island, about 3000 new cases will be diagnosed in women; 1100 women will die from cancer.¹ The role of clinical practice in the prevention and early detection of cancer should be of concern to all physicians. This article will focus on the early detection of cancer in women through screening.

Cancer screening tests are valuable in those cancers that are detectable before symptoms ensue and for which treatment exists and is beneficial at earlier stages of disease. The disease must be of sufficient prevalence in the population screened to ensure acceptable levels of specificity and sensitivity;² thus very rare cancers are not screenable. Screening tests should be reliable and standardized. Screening tests should also be cost-effective, a controversial measure of benefit. (What is the monetary value to society of early detection of a cancer?)

Effective cancer screening for women begins with selecting the tests relevant to an individual's age, family history, lifestyle, and environment. We will review the often controversial recommendations made by expert panels for common cancers in women.

Lung Cancer

Lung cancer will kill more women than any other malignancy; in Rhode Island about 325 women will die, and an equal number will be diagnosed. Cigarette smoking, asbestos and perhaps radon exposure are associated with lung cancer. Reduction of morbidity and mortality in lung cancer may best be accomplished by primary prevention, eg, avoiding exposure to cigarette smoke, since no reliable screening test for

lung cancer currently exists. Chest X-rays do not detect lung cancer at a stage allowing improvement in mortality. Sputum cytology does not qualify as a screening test.³ Further refinements of radiographs and cytology are under study in hopes of improving the early detection of this lethal disease.

Breast Cancer

Breast cancer is a significant cause of morbidity and mortality in American women. In 1994, about 182,000 women in this country will develop carcinoma of the breast and 46,000 women will die from this disease. In Rhode Island, there will be 800 new cases diagnosed and 230 breast cancer deaths. Breast cancer is the second leading cause of cancer death in women. It should be noted that the incidence of breast cancer in the US continues to rise despite, or perhaps (in part) because of improved diagnostic abilities, as well as increased awareness of breast cancer and breast cancer screening among women and their physicians.

Screening tests should be cost-effective, a controversial measure of benefit. (What is the monetary value to society of early detection of a cancer?)

Certain factors are correlated with increased risk for developing breast cancer. Primary among these is gender; others include: age over 40, increasing age, family history of premenopausal breast cancer in a first degree relative, menarche prior to age 12, first pregnancy after age 30, obesity, high socioeconomic status, and personal history of ovarian or endometrial carcinoma. There is a reduction of premenopausal breast cancer in women who have lactated.⁴ Dietary influences, such as high fat and alcohol intake, remain controversial.

It has been shown that the death rate from breast cancer can be reduced by screening with mammography.⁵ The reduction of mortality by screening women aged 50 to 74 annually is well documented. The first randomized screening study was begun in 1963 by the Health Insurance Plan of Greater New York (HIP). The women studied were between the ages of 40 and 64. By 1969, a 30% reduction in mortality was

The available literature best supports cancer screening in women for breast, colorectal and cervical neoplasia.

demonstrated, primarily in women over 50. Women who entered the HIP study at ages 40 to 49 demonstrated a 24% reduction in mortality 18 years following enrollment. This mortality reduction did not achieve statistical significance until about 8 years of follow-up.

Although not a randomized study, the Breast Cancer Detection Demonstration Project (BCDDP), begun as a collaboration between the National Cancer Institute (NCI) and the American Cancer Society (ACS), has provided essential information on the effectiveness of breast cancer screening among women ages 40 and over. Of the 280,000 women subjects, half were under 50.⁶ In the BCDDP, 90% of breast cancers diagnosed in women ages 40 to 49 were found through screening, a tremendous improvement over the HIP study, in which only 38% were found through screening. Improvements in mammography made the difference. Patients diagnosed in the BCDDP, even accounting for lead time, had improved survival when compared with all women diagnosed with breast cancer, as reported to the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute. In the 14-year follow-up of the BCDDP, age-adjusted survival and case fatality rates were not significantly different among women ages 40-49, 50-59, and 60-69 years.

Screening studies in the Netherlands, Sweden, and the United Kingdom support mammographic screening for breast cancer, including women ages 40 to 49 years.⁷

ABBREVIATIONS USED

ACS: American Cancer Society
BCDDP: Breast Cancer Detection Demonstration Project
FOBT: Fecal occult blood testing
HIP: Health Insurance Plan of NY
HPV: Human papilloma virus
MQSA: Mammography Quality Standards Act
NBSS: National Breast Screening Study
NCI: National Cancer Institute
PAP: Papanicolaou smear
SEER: Surveillance, Epidemiology, and End Results

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A great controversy has arisen, however, about the use of screening mammography among women ages 40 to 49, following the release of findings from the Canadian National Breast Screening Study (NBSS). The NBSS was designed to compare screening efficacy among women ages 40 to 49 years and women ages 50 to 59. The women were recruited between 1980 and 1985. Although no statistically significant improvement in survival was reported for the younger group, multiple criticisms of the study and its design raise serious questions about the results. Symptomatic women, some with advanced disease, were included among screening subjects. Questions were raised about the quality of the mammography performed. Technique was not standardized; dedicated equipment was not uniformly employed; technologists and radiologists received no uniform training, and physicians who received the results were not educated about the significance of the findings. Expert consultants from the United States and Europe resigned because of the poor quality of images, poor and variable film interpretation, study design, and other issues of implementation. Thus, citing the Canadian NBSS as a reason not to screen is questionable.

Reduction of morbidity and mortality in lung cancer may best be accomplished by primary prevention, eg, avoiding exposure to cigarette smoke, since no reliable screening test for lung cancer currently exists.

Nonetheless, the controversy about screening women under 50 years of age persists.^{8,9} Early in 1994, the NCI modified its recommendation for screening with mammography, omitting a recommendation for women ages 40 to 49. The ACS reviewed all available information and concluded that women and their physicians need to be advised of the "life-saving potential of periodic examination by mammography and clinical breast examination."¹⁰ The ACS continues to recommend the following screening guidelines:

- **Breast self-examination** monthly beginning at age 20.
- **Clinical breast examination** every 2 to 3 years for women ages 20 to 40, and annually for women ages 40 and over.
- **Screening mammography** every 1 to 2 years for women ages 40 to 49, and annually for women ages 50 and over.

It is recommended by many that annual screening begin earlier among women who have a personal history of breast cancer or

biopsy proven atypia, women with a first degree relative who has had premenopausal breast cancer, and women who delay child-bearing beyond age 30.

Since 1987, the American College of Radiology has accredited mammography facilities that meet strict standards for equipment, images, and processing. Beginning October 1994, the Mammography Quality Standards Act (MQSA) of 1992 requires that all facilities reimbursed for Medicare patients be accredited.

Colorectal Cancer

The expected number of new cases of colorectal cancer in Rhode Island women is 350; 150 will die from the disease. Women over 50 are at increased risk for colorectal cancer, as are those with a history of breast, ovarian or uterine cancer, or a history of inflammatory bowel disease. Family history of either colon polyps or cancer increases the risk. Screening should be performed in those patients at increased risk because of family history, inflammatory bowel disease, or a history of polyps. Whether and how to screen the larger population remains controversial. Annual fecal occult-blood testing (FOBT) has been shown to reduce the death rate from colorectal cancer in recent case-control and randomized studies.^{11,12} However, fecal occult-blood testing carries high false negative and false positive rates of disease detection and is an inefficient and insufficient method of screening.¹³

Sigmoidoscopy may be a more effective screening tool, but wide implementation may be limited by cost, patient compliance, and physician training. A recent case control study documented a decrease in death rate from cancers within the reach of the sigmoidoscope, even if performed every 10 years.^{14,15} The current ACS guidelines encourage annual rectal exam after 40, FOBT annually after 50, and flexible sigmoidoscopy every 3 to 5 years beginning at age 50.

Endometrial Cancer

Endometrial cancer is the most common cancer involving the reproductive tract. About 31,000 American women will die of the disease. It is a frequently curable lesion, with an estimated 94% 5-year survival rate. It has the added advantage of frequently presenting at an early stage with vaginal bleeding. Post-menopausal women are at risk for endometrial cancer; other risk factors involve unopposed stimulation of the endometrium by estrogen (found in chronic anovulation states), unopposed exogenous estrogen use, and obesity. Infertility, early menarche and late menopause are also risk factors.

Screening by endometrial sampling is an effective tool in women with abnormal uterine bleeding, particularly post-menopausally. Asymptomatic women should not be screened, because the prevalence of endometrial cancer is low in the general population. A transvaginal ultrasound performed before endometrial sampling may further define the patients at risk for cancer by measuring the thickness of the endometrium; women with thicknesses of less than 9mm were not found to have cancer in one study.¹⁶

Cervical Cancer

Screening with the Papanicolaou (PAP) smear has decreased the incidence of invasive cervical cancer. In the US in 1994, about 55,000 women will develop carcinoma-in-situ (250 in Rhode Island) and 13,000 will develop invasive tumors (70 in Rhode Island); 4000 deaths from cervical cancer are expected nationwide, and 10 in Rhode Island. The human papilloma virus (HPV) has been found in most pre-cancerous and cancerous lesions of the cervix. Risk factors for cervical cancer include prior known HPV infection, HIV infection and other immunosuppressive diseases, multiple sexual partners, other sexually-transmitted disease, early age at first intercourse, and cigarette smoking.

... women and their physicians need to be advised of the "life-saving potential of periodic examination by mammography and clinical breast examination."

The PAP smear is recommended in women beginning with onset of intercourse or at ages 18 to 20. Screening is recommended annually in higher risk patients and, by some experts, in the average risk group as well. Women at low risk may be screened up to every 3 years until age 65. If PAP smears are routinely negative, the benefit of screening after age 65 is small.¹⁷

The sensitivity and specificity of the PAP smear is subject to inter-laboratory variability. This may be of importance in selecting a laboratory for use.

Ovarian Cancer

Ovarian cancer causes more deaths annually than any other malignancy of the reproductive tract, despite being the least common of the three. About 12,500 women die of ovarian cancer in the US annually (70 in Rhode Island). Risk factors for ovarian cancer include increasing age, family history, and nulliparity. Unfortunately, there is no accepted screening procedure for ovar-

an cancer. The tumor marker CA 125 is increased in a variety of benign conditions and is not specific for early disease. Also, transvaginal ultrasound is currently neither specific nor sensitive enough to qualify as a screening tool. In women with the rare hereditary cancer syndrome, estimated to account for fewer than 1% of all women with ovarian cancer, referral to a gynecologic oncologist is recommended.^{18,19}

Generally, other cancers such as pancreatic cancers and lymphomas may not be screened at this time. A thorough skin examination may contribute to reduction in morbidity and mortality from malignant melanoma, but an effective examination interval has not been established.

The available literature best supports cancer screening in women for breast, colorectal and cervical neoplasia. Compliance with screening recommendations can be improved with greater adherence among health care providers and with patient education. Patients should understand that, given the biological complexities of cancer and the relative crudity of currently available screening tests, future screening protocols will evolve and change.²⁰

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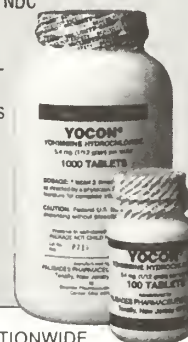
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Cardiovascular Disease and Women

Joann M. Lindenmayer, DVM, MPH, and Lois Monteiro, PhD

Cardiovascular disease refers to a wide variety of heart and blood vessel diseases, including coronary heart disease, hypertension, and stroke. It is the leading cause of death and disability in the United States today. In 1990, more than 900,000 people died of cardiovascular disease, accounting for 43% of all deaths in the US in that year.¹ Because more than half of all cardiovascular disease deaths are contributed by coronary heart disease, and because much of the current debate surrounding cardiovascular disease in women concerns coronary heart disease, this paper focusses largely on the latter.

The Association of Cardiovascular Disease with Male Gender

Cardiovascular disease has long been identified with male gender and, consequently, its effects on women have been underappreciated. The prevalence of coronary heart disease and the incidence of fatal and nonfatal coronary events has always been higher in men than in women. In 1989, the age-adjusted prevalence of coronary heart disease in white men was twice that for white women (33.3/100,000 vs. 15.3/100,000, respectively). In 1988, the age-adjusted mortality rate for coronary heart disease in white men was also twice that for white women (612.7/100,000 vs. 337.6/100,000, respectively),² a difference that has been maintained for decades. In 1980, the age-adjusted incidence rate of nonfatal ischemic heart disease in white men was about three times that in white women (3.7/100,000 vs. 1.2/100,000 respectively) although a decrease among white men and a disturbing increase among white women brought these estimates for men and women closer by 1989 (3.3/100,000 vs. 2.7/100,000, respectively).² Hence, the burden of coronary heart disease by gender has always rested with men but its impact on women has been substantial.

A second reason for identification of

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cardiovascular disease with male gender is that, until the last decade, the vast majority of positions in the medical and research communities have been filled by men. Although a majority of these are still occupied by men, the past 10 years have seen a relative increase in the proportion of positions occupied by women. This shift has been accompanied by increasing interest in health issues that affect women.

The economic effect of work-related disability and death attributable to cardiovascular disease may have been more noticeable in men than women because of male dominance of the paid-for-work force. The median age for all diseases of the heart is lower in men than in women; in Rhode Island in 1988 it was 76.1 years for men and 84.4 years for women.³ Hence, diseases of the heart affect relatively more men than women in their younger, working years, and encourages the identification of heart disease with male gender.

... the burden of coronary heart disease by gender has always rested with men, but its impact on women has been substantial.

In spite of the identification of cardiovascular disease, and coronary heart disease in particular, with male gender, heart disease is the number one cause of morbidity and mortality among women as well as among men. In Rhode Island in 1988, the crude mortality rate from all diseases of the heart was the same for men and women (321.1 deaths/100,000/year). However, because women constitute a greater percentage of the population than do men, the actual number of deaths among women was greater than among men—1676 vs 1546, an annual excess of 130 deaths attributable to heart disease in women compared to men.³ These deaths are a measure of the public health burden of mortality from heart disease, which for Rhode Island is greater for women than for men. Each year more women die from heart disease than from all malignancies, including breast and cervical cancer, combined. In Rhode Island in 1991, the incidence rates for cardiovascular disease and for all malignancies combined were 321.1/100,000 and 220.9/100,000, respectively, equivalent to 1676 and 1153 deaths, or 45% more deaths in women due

Each year more women die from heart disease than from all malignancies, including breast and cervical cancer, combined.

to cardiovascular disease than to malignancies.³ Yet breast and cervical cancer, perhaps because of their greater gender-specificity, are far more closely identified with women than is cardiovascular disease.

Cardiovascular Disease in Women: a Separate Discipline?

The idea that cardiovascular disease in women should be treated as a separate discipline is increasing in support. There are many reasons for this. Among them:

1. It is generally acknowledged that women have long been underrepresented in observational and random clinical trials of coronary heart disease.^{4,5} As recently as 1990, a randomized clinical trial of aspirin therapy for the primary prevention of myocardial infarction in men was reported.⁶ As a consequence of this and other studies, the United States Preventive Services Task Force recommended low-dose aspirin for primary prevention of myocardial infarction in men, but made no such recommendations for women.⁷ Although study participants are historically more likely to be men, it is unrealistic to think that results of such trials are being withheld from women in practice. Members of the Women's Caucus, a working group on women's health of the Society of General Internal Medicine, reviewed the subject of hypertension and concluded that gender influences the natural history of hypertension, that little research had been conducted into side effects of antihypertensive medications in women, and that these should be accounted for in treatment regimes. The same group also found that guidelines for the current treatment of hypertensive women did not address these gaps in knowledge.⁸ According to one author, another consequence of using male study participants has "prevented full consideration of some aspects of coronary disease in women, for example, estrogen as an antiatherogenic agent and its role in the primary and secondary prevention of coronary disease in women."⁹

ABBREVIATIONS USED

CABG: Coronary artery bypass grafting
PTCA: Percutaneous transluminal coronary angioplasty

2. A number of studies have suggested that the probability of coronary heart disease in women and the positive predictive value of tests for the diagnosis of coronary heart disease in women are low.^{10,11} These and other studies may have minimized patient and physician perceptions of the risk and severity of coronary heart disease in women and discouraged physicians' use of diagnostic interventions.
3. Studies of surgical interventions (percutaneous transluminal coronary angioplasty, or PTCA, and coronary artery bypass grafting, or CABG) for the treatment of established coronary artery disease have determined that women do not experience as much symptomatic relief following surgery as do men and that they experience higher postoperative mortality rates than do men.^{12,13} The poorer outcomes in women can largely be accounted for by the relatively older age of women patients, the larger proportion of women patients with urgent or emergency CABG surgery, the greater number of comorbid conditions at the time of surgery (diabetes, hypertension), and smaller vessel size and associated greater technical difficulty of surgery. However, the concern has arisen that surgical interventions of proven efficacy may be underutilized in women because of their greater risk for postoperative complications and death.

... there are good reasons to suspect that cardiovascular disease has until now received less attention in women than in men, is underdiagnosed or diagnosed relatively later in the course of illness than it is for men, is treated less aggressively in women than men, and may be treated without regard for gender-specific risk factors.

In short, there are good reasons to suspect that cardiovascular disease, and coronary heart disease in particular, has until now received less attention in women than in men, is underdiagnosed or diagnosed relatively later in the course of illness than it is for men, is treated less aggressively in women than men, and may be treated without regard to gender-specific risk factors. Hence, the current debate surrounding diagnosis and management of cardiovascular disease in women focuses on these issues: Do there exist inequalities with respect to the diagnosis and treatment of cardiovascular disease in women? If so, are these differ-

ences wholly or partly attributable to gender? and, if gender-specific differences in diagnosis and management of cardiovascular disease exist, do they lead to poorer outcomes, such as increased morbidity or mortality, or decreased quality of life?

Cardiovascular Disease in Women: The Facts

The diagnosis of heart disease depends on a number of factors, including an individual's own assessment of personal susceptibility to disease, recognition of disease-associated symptoms, degree of access to health care, and physician assessment of the individual's probability of disease. A recent study of emergency medical services use found that women and older people are more likely to delay calling 911 with signs of a heart attack.¹⁴ Reasons suggested for this behavior are that the higher prevalence of comorbid conditions such as angina, congestive heart failure, and diabetes among these groups may lead to misinterpretation of symptoms or to failure to notice symptoms at all, and to the belief among women that heart attacks are a man's, not a woman's problem. Numerous other studies have documented that in cohorts of patients defined by hospitalization for suspected or documented coronary heart disease, women are older and have more functional limitations, but are less likely to have multivessel disease.^{15,16} In a recent commentary in the *Journal of the American Medical Association*, Clancy and Massion¹⁷ cite evidence that women are more likely to encounter financial barriers to access to health care. Tobin and colleagues, in a study of sex bias in considering coronary artery bypass surgery, found that for patients with abnormal nuclear medicine tests, men were six times as likely as women to be referred for additional diagnostic tests (cardiac catheterization). This study also reported that half as many men as women were thought by their physicians to have noncardiac causes of their symptoms, even though there was no difference between the two groups with regard to use of antianginal medications.¹⁸ The effect of these factors could be to delay the diagnosis of coronary heart disease in women to older age or to a later stage in the course of disease, when therapy is less likely to be successful. Hence, deferral of evaluation, diagnosis, and intervention could be considered an independent risk factor for poorer outcomes.¹⁹

The issue of gender bias in the management of coronary heart disease has received much attention in the past few years in the medical literature.^{12,18,20-23} Most of these studies have been retrospective cohort studies carried out at single or affiliated teaching

hospitals in large urban centers, although a few have attempted to use population-based data such as Medicare²⁰ and state-based hospitalization discharge data.²² Authors of these studies have attempted to adjust for numerous confounding factors in their assessment of the effect of gender on the use of procedures such as coronary angiography, PTCA, and CABG; where studies have been based at teaching hospitals, adjustment has been more thorough because of investigator access to patient medical records. The use of Medicare and hospitalization discharge data largely precludes inclusion of longitudinal information on individual patients. In general, women were referred for thrombolytic therapy,¹² coronary angiography,^{12,18,20-23} and revascularization (PTCA and CABG)^{12,20,22,23} less often than were men. In two of these studies, gender differences in rates of referral for CABG persisted when only catheterized patients were considered in the analysis.^{20,21} Two studies reported similar rates of CABG,^{12,23} and two reported similar rates of PTCA^{12,21} when only catheterized patients were considered. These latter studies have been cited as evidence for the Yentl effect,⁹ that once a woman is shown to have a man's disease, she is treated as a man would be.

A recent study of emergency medical services use found that women and older people are more likely to delay calling 911 with signs of a heart attack.

There seems to be little doubt, however, that the weight of evidence points to gender-specific rates for the application of diagnostic and therapeutic interventions for cardiovascular disease. Some of the authors of these studies make the point that just because women are referred for relatively fewer procedures should not imply that women be subjected to more. It is impossible to know in the context of studies that only analyze gender-specific rates of procedures whether women are subjected to too few, or men to too many, procedures. What is needed is context—a measure, not only of the outcome of such procedures, but according to Wenger, an "index of cardiovascular risk for prognostic purposes and also to assess the appropriateness of therapy."¹⁹

Two recent studies have attempted to address this problem. Bickell and colleagues²⁴ found that, among patients with catheterization-documented coronary artery disease, there was no overall gender difference in the use of CABG except when it was related to the risk for cardiovascular death. Of patients with low risk for cardiovascular

death, men were more likely than women to be referred for CABG, when in fact, surgery offers little or no benefit over medical therapy, but among patients in the group at highest risk for cardiovascular death, no gender effect was found. The authors concluded that women may be more appropriately referred for surgery than men. Mark and colleagues²⁵ found that after adjustment for confounding factors, gender was not an independent predictor of referral for catheterization. In this study, physicians' predictions of the probability of angiographic evidence of obstructive coronary disease were compared with mathematical model predictions for the same. The probability of severe coronary disease in women was actually overestimated by physicians relative to model predictions, and underestimated for men. The authors concluded that the probability of severe coronary disease among women who underwent catheterization was not underestimated.

Conclusions and Future Directions

There has been a steady decline in coronary death rates for men and women since the mid 1960s and little doubt that the results of studies conducted primarily in men have contributed to this decline. The question is, could outcomes have been better in women, and can more rational decisions about the management of cardiovascular disease in women be made? Women and men differ with regard to biology, physiology, psychology (the desire or ability to modify certain behavioral risk factors for disease) and socioeconomic factors (access to health care). Recognizing these differences, the results of studies that have largely excluded women should not be blindly applied to women. At the very least, women should be included in future clinical trials of diagnostic and therapeutic interventions so that knowledge can be gained and more rationally applied to the management of cardiovascular disease in women. Recognizing that fundamental differences do exist between men and women with regard to cardiovascular disease, a measure of outcome equivalence, rather than equivalent delivery of services, should be developed. Furthermore, evaluation of this measure of outcome, whether it be decreased mortality, decreased morbidity, improved quality of life, or another measure that takes all into account, should consider some measure of preprocedure risk stratification that would allow a distinction to be made between biology and gender.

Considering the public health burden of cardiovascular disease in women, further research will be particularly important as

the population continues to age, as more women enter the work force and are subjected to workplace stresses, and as health care reform raises the hopes for increased access to health care services and procedures. The existence of the current debate signals a need for more knowledge regarding gender-specific risk, diagnosis, management, and outcome of cardiovascular disease.

... studies have been cited as evidence for the Yentl effect, that once a woman is shown to have a man's disease, she is treated as a man would be.

Several efforts are underway to expand knowledge of cardiovascular disease in women. One of these is establishment of the Office on Research in Women's Health of the National Institutes of Health.⁵ This office will oversee the Women's Health Initiative, the largest community-based clinical intervention and prevention trial ever undertaken. Rhode Island is one of the sites for this study. In this randomized clinical trial, postmenopausal women will be studied for the effects of dietary modification, exercise, hormone therapy, and smoking cessation for the prevention of cardiovascular disease, among other conditions. While Rhode Island's female population will be participants in the Women's Health Initiative, the apparent excess of mortality from coronary heart disease in women over men in Rhode Island suggests the continuing importance of emphasizing primary and secondary prevention efforts for this group.

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Pharmacotherapy in Women: Do Clinically Important Gender-Related Issues Exist?

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Women have been relatively excluded both from government and privately sponsored research in drug development. This is in sharp contrast to the fact that women are prescribed and use more medications than men, experience a higher rate of adverse medication reactions including drug associated causes for hospital admission than men, and may differ in their pharmacokinetic and pharmacodynamic profile from men. This article will review potential gender differences in the areas of medication utilization, adverse reactions, and pharmacokinetics and pharmacodynamics, and will conclude with recommendations for optimal pharmacotherapy in women, along with the present research guidelines for inclusion of women in drug studies.

Medication Utilization in Women

Women use more prescriptions and over-the-counter medications than men in the US as well as in other countries.¹⁻³ Early large scale trials documented that 66% of women vs. 54% of men, in all age groups, are prescribed medication. Polypharmacy, or the use of more than five prescriptions, is higher in women than men: 31% of women vs. 14% of men in the 30-44 year age group, and 38% of women vs. 23% of men in the 45-59 year group were prescribed more than five medications. While the differences become less marked with increasing age, older women continue to be prescribed more medications than older men.⁴ Recent research suggests that in a large population of older persons (mean age, 75 years), the

median number of total prescriptions for one entire year was 24 for women vs. 18 for men.⁵ Medications most commonly reported in these studies include analgesics, psychotropics, and in older persons, cardiovascular agents.

Psychotropics

Psychotropics represent one group of medications where gender based differences have been studied. Hohmann investigated both true and artifactual reasons why women might receive prescription psychotropics more often than men.⁶ A true reason for receiving a psychotropic would be a higher rate of mental illness, while an artifactual reason would be a woman's greater expression of symptoms. Both reasons have been documented to occur in women, for example, the higher reported rate of depression and higher scores on indices rating non-chronic morbidity. Using the National Ambulatory Medical Care Survey database (NAMCS), Hohmann showed that women received more anxiolytics and antidepressants even after controlling for patient's presenting complaint, psychiatric diagnosis, and patient symptoms. Gender differences were not reported in the prescription of sedative/hypnotics or antipsychotic drugs. As the NAMCS data base controls for repeat physician visits, greater access to prescriptions was not a reason for the increased prescription of anxiolytics or antidepressants. Rather, the author concluded that either women demand and/or men refuse these prescription drugs, or physician bias is altering this prescriptive decision.⁶

Evidence for physician bias in the prescription of psychotropic medications between male and female patients by male or female physicians was studied in a retrospective review in 108 patients from a family practice setting. The results demonstrated that female patients were three times more likely to receive a psychotropic than men (95% CI 1.4, 6.9). Both male and female physicians were more likely to pre-

Specific issues in women that may alter the pharmacokinetics of a drug include the phase of the menstrual cycle, the concomitant use of exogenous hormones (either contraceptives or estrogen replacement therapy), or the presence of pregnancy or lactation.

scribe psychotropics to female patients than male patients. However, the rate was significantly higher for male physicians.⁷ Most of the difference in the prescription of psychotropics in this study was attributable to antidepressants.

Depression continues to be under-recognized or misdiagnosed in the primary care setting and has increased attention to its appropriate diagnosis and treatment in our own community. Data from the Pawtucket Heart Health Program, a population-based sample, shows that the prevalence rates of antidepressant use per 1000 population has changed. Among women, the prevalence rate increased from 9.2 (95% CI 4.2, 14.2) in 1981-1982 to 42.9 (95% CI 31.5, 54.4) in 1992-1993, while the reported use by men remained essentially unchanged throughout the twelve year period. The increase in reported usage of antidepressants among women was apparent both for the older tricyclic agents, as well as for the newer drugs such as fluoxetine.⁸

Use of anxiolytics such as benzodiazepines is also higher in women than men, with self reported, medically non-acceptable reasons for use in 43% of the patients. Examples of unacceptable uses for benzo-

ABBREVIATIONS USED

ACE: Angiotensin converting enzyme (inhibitors)

ACTG: AIDS Clinical Trials Group

ADR: Adverse drug reactions

AIDS: Acquired immune deficiency syndrome

ALT: Alanine aminotransferase

CI: Confidence interval

FDA: Food & Drug Administration

HIV: Human immunodeficiency virus

NAMCS: National Ambulatory Medical Care Survey

NSAIA: Nonsteroidal anti-inflammatory agent

PCP: Pneumocystis carinii pneumonia

TIMI: Thrombosis in Myocardial Infarction study

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diazepines include the treatment of hypertension and other cardiovascular disorders.⁹

Cardiovascular Medications

Differences in the use of cardiovascular agents between men and women have also been demonstrated in five biennial cross-sectional population-based surveys conducted as part of the Pawtucket Heart Health Program.¹⁰ In these data from southeastern New England residents, significantly different prescriptive trends were seen in the use of central alpha-agonists, diuretics, and combinations of antihypertensives between women and men, with greater use among women. Men experienced a decrease in the prescription of diuretics over the 9 years of study, while women did not.

While women have been prescribed more medications than men in many reports, several recent studies have suggested that important gender differences may exist in the treatment of certain diseases such as myocardial infarction and in the use of thrombolytic agents.¹¹ In one study of tissue plasminogen activator involving 1,028 individuals, only 16% of women screened for the study were eligible to receive a thrombolytic, as compared with 25% of men. Women frequently had multiple reasons for being ineligible to participate in the study; women were more likely to be over 75 years of age, have medical contraindications, have non-diagnostic electrocardiograms, and to have had anginal symptoms for over six hours. More importantly, among eligible participants, only 55% of women received a thrombolytic agent, as compared to 78% of men.¹² Women who receive thrombolytics may have an altered response during treatment for myocardial infarction. Data from the Thrombolysis in Myocardial Infarction (TIMI-II) study suggested that women who received tissue plasminogen activator experienced a morbidity and mortality rate that was significantly higher than men.¹³ Similar findings have been reported in other large scale thrombolytic studies.^{14,15} The reasons for the apparent under-utilization of thrombolytic agents and poorer outcome to treatment in women are unknown, but clearly involve multiple factors.

Zidovudine

Another important drug for which gender-based prescribing differences may exist is zidovudine. In one recent study using data from the AIDS Cost and Service Utilization Survey, asymptomatic HIV positive women were 20% less likely than similar men to receive zidovudine, after adjusting for differences in income, race, insurance

coverage, and geographic area. The reasons for this difference in usage are unknown, but may involve previous concerns about the use of zidovudine in pregnant women. The preliminary findings from AIDS Clinical Trials Group (ACTG) protocol 076 have recently indicated that zidovudine is actually associated with a 67.5% reduction in the risk of HIV transmission from mother to infant.¹⁷

An alternative reason to explain the differences in prescription of zidovudine may be the subspecialty of physicians used by women, often gynecologists rather than internists. The latter receive most of the AIDS educational campaigns. Among symptomatic HIV positive men and women, a difference in the use of zidovudine was not apparent.¹⁶ These findings are similar to a report from the Robert Wood Johnson Foundation's AIDS Health Services Program.¹⁸ Women who had asymptomatic HIV infection or who had AIDS without *pneumocystis carinii* pneumonia (PCP) were not offered zidovudine as often as men. The gender prescribing differences did *not* exist for persons with AIDS and PCP.

... female patients were three times more likely to receive a psychotropic than men. Both male and female physicians were more likely to prescribe psychotropics to female than male patients.

Adverse Drug Reactions in Women

Drug-related morbidity and mortality have been recognized as a significant problem. In 1987, over 12,000 deaths and 15,000 hospitalizations were attributed to adverse drug reactions (ADR).¹⁹ While increasing age has been associated with a greater risk of ADRs, possibly due to the presence of multiple co-existing diseases and physiologic changes, it is unclear whether men and women differ in their susceptibility to the side effects of drugs. The literature contains conflicting results regarding gender differences in the rate of ADR-related hospitalizations. In one study of ADRs causing admission to a major teaching hospital, the rates differed significantly between men and women (36.7% and 63.3% respectively).²⁰ However, in several large, classic studies evaluating the rate of iatrogenic illness occurring during hospitalization, no differences were detected between men and women.^{21,22} Also, in a survey of self-reported

ADRs in participants of the Iowa 65+ Rural Health Study, 7.1% of men and 8.3% of women reported at least one drug-ADR pair; this difference was not statistically significant.²³ Discrepancies in these publications may be due to difficulties in defining ADRs, to a lack of formal hypotheses designed to test for gender differences in ADRs, and to the types of drugs available when the research was done.

Despite the absence of differences reported in some general studies of ADRs, data from recent clinical trials have suggested that women may be at greater risk for some drug side effects. Traditionally, women have been considered to be at increased risk with NSAIA (induced peptic ulcer disease and of aminoglycoside-induced nephrotoxicity). Any evaluation of possible gender related issues with ADRs requires careful attention to the prevalence of diseases (eg depression) in men and women, the frequency of participation by the two sexes in clinical trials, differences in age and concomitant diseases, differences in the pharmacokinetics for a given drug, as well as psychosocial differences, such as the likelihood to report side effects from a medication spontaneously. The following section presents an overview to selected gender related issues with ADRs.

ACE Inhibitors and Cough

Cough is a common side effect associated with the use of all ACE inhibitors. While the exact incidence of coughing is unknown, estimates have ranged from 0 to 39% of patients treated with various ACE inhibitors.²⁴ One consistent finding in the available studies has been the predominance of women among the reported cases, often well in excess of 50%.²⁴ While this may reflect simply a higher percentage of women in ACE inhibitor studies, or that women are more likely to report symptoms spontaneously, results of a recent study dispute these explanations. Using strict methodologic criteria for evaluating subjective side effects, both from spontaneously reported cases and from cases elicited by questionnaires, all individuals in a hypertension clinic were directly interviewed about their coughing. While about half the cases were judged not to be due to the ACE inhibitor, the gender difference remained, with the frequency of cough in men and women to be 4.4% and 10.5%, respectively.²⁵

The mechanisms for ACE inhibitor-induced coughing remain unknown, although many theories have been proposed, including possible effects of prostaglandins, kinins, and substance P, as well as a genetic

link. The threshold for coughing may actually be lower in women than men.²⁶

Antiarrhythmic Agents & Torsade de pointes

All antiarrhythmic agents have the potential to induce life-threatening arrhythmias. *Torsade de pointes*, or polymorphic ventricular tachycardia with a prolonged QT interval, has been associated primarily with the use of quinidine, procainamide, disopyramide and amiodarone. Proposed risk factors for *torsade de pointes* have included hypokalemia, hypomagnesemia, concurrent digoxin therapy, underlying organic heart disease, and prior evidence of delayed repolarization. A recent meta-analysis has suggested that women may be at greater risk for the development of *torsade de pointes* than are men.²⁷ In the report, the expected prevalence for women was assumed to be 50% or less. However, women comprised 70% of the reported cases in the medical literature. After controlling for the presence of other risk factors, the higher prevalence of women among the reported cases still persisted. Possible explanations for the difference between the expected and actual prevalence rates for women include potentially higher serum levels of the antiarrhythmic agent in women, as well as the potential for subclinical hypothyroidism which might predispose to the arrhythmia. However, in the studies where serum quinidine levels were available, the values were similar between men and women. Finally, women may possess longer average QT intervals than men; this may be the physiologic basis for the proposed greater risk for *torsade de pointes* reported in studies.

Tacrine and Hepatotoxicity

Tacrine was the first drug approved by the Food and Drug Administration (FDA) for the treatment of Alzheimer's disease. While tacrine has been reported to provide modest benefit for some patients with mild to moderate Alzheimer's disease, increased serum levels of alanine aminotransferase (ALT) has been the most common and significant side effect occurring in at least 49% of the 2446 patients receiving the drug.²⁸ Among the 1203 patients who developed increased ALT levels, women consistently were more susceptible than men, and at all levels of increased ALT a higher percentage of women were present than men. The reasons for why women may be at greater risk of developing increased ALT levels are unknown, especially as small and older individuals appeared to be less likely to develop increases than younger and larger

study participants, contrary to expectations.²⁸ The pharmacokinetics of tacrine are complex, with low oral bioavailability and extensive hepatic hydroxylation. One study has suggested that serum tacrine concentrations are higher in women than men. However, wide inter-individual variability in tacrine concentrations existed, and the value of drug levels in predicting increases in ALT has remained controversial.²⁹

Pharmacodynamic Issues

Selection of an appropriate dose requires an understanding of the pharmacokinetics of the individual drug. The pharmacokinetic profile is the concentration of drug in blood or tissues over time, and is determined by the rates of absorption, distribution, and elimination of the compound. The pharmacokinetic profile of a medication may be influenced by age, sex, ethnic background, metabolic phenotype, body composition and size, and the presence of other medications or coexisting diseases. Specific issues in women which may alter the pharmacokinetics of a drug include the phase of the menstrual cycle, the concomitant use of exogenous hormones (either contraceptives or estrogen replacement therapy), or the presence of pregnancy or lactation.

Women who receive thrombolytics may have an altered response during treatment for myocardial infarction.

Gender differences in the pharmacokinetic profiles of drugs have rarely been addressed in the literature. Most pharmacokinetic studies have been completed in healthy young males. When females are included, it is customary for pregnant women to be excluded, and rarely does the study control for the menstrual phase of the woman. Drug interactions due to the use of exogenous hormones are commonly discovered only after a drug is marketed. In spite of these shortfalls in the literature, several studies suggest the potential for clinically significant changes in a drug's pharmacokinetic profile in women.

Women secrete less gastric acid than men, leading to differences in the absorption of certain drugs. The time to peak drug absorption may be slower in women than men and may change during the menstrual phase. For instance, the time to reach peak salicylate concentrations varied from 60 minutes on day 2 of the menstrual cycle to 37 minutes on day 14, increasing to 47 minutes by day 25. The overall extent of

absorption appears to be similar in men and women, despite the faster gastric emptying time in women during the mid-menstrual cycle. Women who are pregnant have a delayed gastric emptying time.³⁰

The distribution of a drug is influenced both by its lipophilicity and protein binding. Since women have a higher overall proportion of body fat than men, the volume of distribution of lipophilic drugs may be higher in women than men, even after controlling for total body weight. Benzodiazepines with very high lipid solubility have been shown to have larger volumes of distribution in women. The data, however, are difficult to interpret because the metabolism of these compounds may also be changed during a woman's menstrual cycle, and typically, studies have not controlled for confounding variables such as the use of hormonal contraceptives.

Individualizing the dose of medication based on genetic phenotype (one's inborn ability to metabolize a drug) has been suggested for some groups of medications. Does sex dimorphism occur in the enzyme systems that would cause changes in a woman's ability to metabolize drugs? One example of this difference is the gender-specific ability to metabolize alcohol.³¹ Alcoholic liver disease develops more rapidly in women than men and women achieve higher alcohol serum concentrations than men after equivalent doses. Frezza and colleagues investigated the reasons behind these differences and found that women have significantly less gastric metabolism of orally consumed alcohol than men, due to a decrease in gastric alcohol dehydrogenase. Thus, even after controlling for the amount of alcohol consumed by weight, women will achieve higher alcohol serum concentrations than men, due to a lessened ability to metabolize this compound in the gastric mucosa.³¹

Do sex-linked differences also exist in the ability to metabolize drugs in the liver? Research has shown a sex-linked ability to metabolize drugs in animal models.³² An emerging body of literature suggests that there may be sex related differences in the human cytochrome P-450 group of enzymes that metabolize many drugs. For instance, after oral administration of propranolol to young men and women, the clearance of this drug was 63% higher in men than women. Not every metabolic pathway was equally changed: the P-450-mediated side-chain oxidation of propranolol was 137% higher in men than women, and glucuronidation was 52% higher in men than women, but ring oxidation was not different.³³ These

results suggest that some but not every P-450 isoenzyme that metabolizes propranolol demonstrates sex dimorphism. Other component enzymes in the P450 system, such as CYP3A, have been shown to have higher activity in women than men.³⁴

Studies have also demonstrated sex dimorphism in the xanthine oxidase enzyme system that metabolizes many purines and pyrimidines such as caffeine, theophylline, and the thiopurines. Using surgical biopsy tissue from male and female patients, a 21% increase in xanthine oxidase activity was demonstrated in males.³⁵ Pharmacokinetic studies are needed to test possible gender differences in patients' serum concentration related to metabolic rates. However, research shows that the bioavailability of mercaptopurine is lower in children with high xanthine oxidase metabolic activity, and that this decrease in systemic exposure to mercaptopurine is a prognostic factor in leukemia relapse.³⁶ Historically, male sex has been a predictor for relapse in acute lymphoblastic leukemia.

Clearly, sex-linked differences in a woman's ability to eliminate medications should lead to dosage changes when prescribing a particular drug. Evidence also exists, however, to show that one's genetic phenotype may also increase the risk for some adverse drug reactions. For instance, severe hypersensitivity reactions to sulfonamides are mediated by oxidative metabolites from the N-acetyltransferase pathway of enzymes. Slow acetylators were over-identified in a population of patients who had experienced serious skin reactions to sulfonamides.³⁷

It is not known why women experience more adverse drug side effects. Obvious reasons for this excess include: prescription of multiple medications, prescription of inappropriate doses, underlying gender differences in metabolic phenotype, or to a combination of these variables. A further reason for increased effect from medications may be an increase in receptor sensitivity. Such pharmacodynamic differences in medication response between men and women are only suggested in the literature.

Evidence for gender based changes in pharmacodynamic drug response was first reported in animal models.³⁸ Neurologic response to psychiatric drugs in men and women has been studied with very conflicting results. One documented gender difference is an exaggerated prolactin response to antipsychotic therapy. Prolactin secretion is inhibited by dopamine. Women receiving antipsychotic medication have shown high prolactin concentrations after equivalent or smaller doses of antipsychotics than men.³⁸

The clinical consequences of this are generally not well understood. However, the high prolactin response to antipsychotics may play a role in the higher incidence of movement disorders in women treated with antipsychotics.

Changing Policy for Women in Clinical Drug Trials

The Food and Drug Administration has recently changed its drug evaluation policies to increase the inclusion of women in clinical trials. This should provide more useful information about the therapeutic outcomes associated with medication use in women. In addition, this policy should broaden our knowledge about gender based pharmacokinetics and pharmacodynamics.

In 1977, the FDA first required that individuals who will eventually use a specific medication must be included in the Phase I, II, and III clinical trials of the new drug. While women were not specifically mentioned, some reports suggested that in general, women had been included in the early investigations of new drugs. Generally, women have been over-enrolled in new

... the high prolactin response to antipsychotics may play a role in the higher incidence of movement disorders in women treated with antipsychotics.

drug trials of non-steroidal anti-inflammatory agents and under-enrolled in trials of cardiovascular agents. Similar numbers of men and women have been enrolled in new drug trials of antibiotics, antihistamines, and sedative-hypnotics.³⁹

However, an analysis of gender representation in clinical drug trials published in prominent pharmacology journals reveals that in recent years (1989-1991), the proportion of published studies that included only male subjects significantly increased from earlier years, while the proportion of studies published with only female subjects, or with male and female subjects, remained the same. Of the studies with male and female representation, most (>60%) failed to analyze their results for gender differences in side effects or therapeutic outcome.⁴⁰

In 1988, the FDA specifically requested information about safety and effectiveness in subgroups of persons enrolled in new drug trials, including sex, age, and race. Unfortunately, a review by the General Accounting Office suggested that only about 64% of new drug applications were com-

plying with the FDA requirements.⁴¹ The FDA will now review new drug applications to ensure that gender based analyses are being accomplished.³⁹

Pharmacokinetic differences between men and women must now be evaluated prior to new drug marketing. Specifically, the FDA has requested data on the effect of the menstrual cycle and menopausal status on the pharmacokinetics of the drug, the effect of external hormone use on the pharmacokinetics of the drug, and the influence of a new drug on the effectiveness of oral contraceptives. In addition, because of the possible delay in information between publication of knowledge gained in clinical trials and the need to use this information in the protocol development of large scale clinical trials, the FDA encourages the enrollment of women of all ages in all phases of new drug development. This change in policy removes the prohibition of women of child-bearing age from participating in new drug trials.³⁹

Protection of the fetus from possible drug exposure remains a vital concern. Drug studies, especially in early clinical trials, can be better designed to protect the fetus from possible drug exposure. For instance, single dose studies may administer the drug immediately after menses and after negative pregnancy testing. In addition, the assurance of effective contraception will need to become a design priority for longer clinical trials. Institutional Review Boards must carefully evaluate research protocol methods to ensure adequate contraception. When a new drug represents potentially life saving therapy for pregnant women, the FDA now advocates inclusion of pregnant women in the drug's clinical trials. For instance, pregnant women who are infected with the human immunodeficiency virus should be included in early clinical trials of new drugs tested for the treatment of AIDS.

Finally, it is important to note that other professional groups have embraced the new FDA requirements and further delineate the need to include women as research subjects.⁴² Not only will the health knowledge and care of women improve, but also of men. When gender based differences are detected that alter drug pharmacokinetics or some other pharmacotherapy parameter, drug therapy in men is more precisely determined.

Optimal Pharmacotherapy in Women

Optimal prescribing of medications may not differ dramatically between groups of individuals. Some general guidelines for

women include: Prior to the use of any medication, make certain that a diagnosis is firmly established. Hesitate to prescribe medications for nonspecific symptoms or without a defined diagnosis. As was previously cited in this article, medications may be utilized differently in or by women. This may or may not imply inappropriate therapy. For instance, the increase in prescription of antidepressants in women may represent improved diagnosis and treatment of depression. Men with depression may represent a group of individuals who are underprescribed. Be cautious about over-prescription of drugs, as polypharmacy is the most reliable predictor of adverse drug effects.

When choosing a medication, recognize that gender issues may alter a woman's response or side effect profile. For instance, is there evidence for gender differences in pharmacokinetics that would alter the dose? A conservative approach to the choice of an initial dose of medication with slow titration to therapeutic response is recommended.

Is the side effect profile of the medication more severe, or simply different in women than men? Medication side effects are a risk inherent to all drug prescribing. Improved knowledge of drug side effects in women should result in closer patient monitoring and better patient education. Finally, prior to the start of medication, consider the drug interaction potential between the medication and hormonal contraceptives or estrogen replacement therapy.

Conclusions

Gender based differences in prescribing patterns, in certain medication side effects, and in specific pharmacokinetic and pharmacodynamic profiles may be of clinical importance. Our efforts to recognize and to understand these differences have been hampered by a lack of specific research on these issues. Research in gender-based pharmacotherapy will continue to increase, stimulated by recent results and by the new FDA requirements. Application of the knowledge learned from gender-based research in pharmacotherapy should improve drug treatment for both men and women.

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Diagnosis and Treatment of Alcoholism in Women

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...there has been an increase in research on women's alcohol use and a growing recognition that women may have substantial and growing needs for treatment of all substance use disorders.

Traditionally, the diagnosis of alcoholism in women has been more difficult to make than in men because many women were described as "hidden drinkers." By this term, clinicians meant that women traditionally did their drinking in the home, usually drank in a solitary fashion, and rarely came to the attention of law enforcement officials. In contrast, men frequently drank outside the home in clubs or in bars and had more frequent contacts with the law. Also, the negative consequences of alcoholism, homelessness and joblessness, were less likely to be identified in women who worked primarily as homemakers. Thus the impact of alcoholism on women was not fully identified.

Society's expectations of women may also have contributed to a cultural blindness to the problem of female alcoholism. In contrast to the over-idealization of women in general, the stereotype of the woman alcoholic was quite judgmental. References were made to the "hand that rocks the cradle shaky from drinking" or to the "the fallen angel" working as a prostitute. Yet, in 1985 the National Institute on Alcohol Abuse and Alcoholism reported that as many as 6 million American women were drinking excessively: 2.5 million women were problem drinkers, and another 3.5 million women were physically dependent on alcohol.

Little systematic research has been done on the impact of alcohol on women. Research studies have generally included small numbers of women, in contrast to the large population studies which have included men. Significant research has been done on the impact of substance abuse on the fetus and the development of fetal alcohol syndrome.

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More recently, there has been an increase in research on women's alcohol use and a growing recognition that women may have substantial and growing needs for the treatment of all substance use disorders.

Diagnosis and Detection of Alcoholism

Under the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, (DSM IV), the essential feature of substance abuse is a maladaptive pattern of substance use marked by recurrent and significant negative consequences related to the repeated use of substances. These negative consequences may include a failure to fulfill a major role function at work, school, or in the home. Examples of these failures include repeated absences, poor work performance, and neglect of children or household. Other signs of substance abuse include recurrent substance use in hazardous situations such as driving an automobile, repeated substance-related legal problems, or continued use despite having persistent social or interpersonal problems caused or exacerbated by the effects of substances.

Substance dependence implies a more serious syndrome, and in the case of alcohol, physiologic dependence.

Substance dependence implies a more serious syndrome, and in the case of alcohol, physiologic dependence. For most persons suffering from alcoholism, tolerance (the need to consume increased amounts of the substance to achieve intoxication), or withdrawal (a physiologic syndrome resulting from a cessation of the use of the desired substance), are present when regular excessive use occurs. The criteria of substance dependence in DSM IV are set forth in Table 1.

Few, if any, patients will present in the early stages of alcoholism seeking treatment for that syndrome. In fact, they may be unaware that their alcohol use has reached problematic levels. A simple 4-question screening test called the CAGE Questionnaire has been found useful in detecting the possibility of alcoholism. The test is administered at the bedside or in the office (Table

2). The advantages of this test are that it is easily remembered, easily administered, and has a high likelihood of detecting those patients for whom further investigations may be useful. A positive response to one or more of the questions on the CAGE suggests a 50% likelihood of alcohol problems, and a positive answer to two or more questions has been found to have a 90% probability of an alcohol problem.² Those patients with one or more positive answers should be more completely screened for substance abuse problems.

The Michigan Alcohol Screening Test (MAST) was developed by Selzer in 1971 and has been found to be useful in detecting undiagnosed alcoholism.³ Like the CAGE, the MAST is a screening test, but the MAST is a written inventory of 25 questions. A positive answer to five or more questions is usually felt to be indicative of alcoholism. The MAST was designed to screen male alcoholics and was validated in the male population. It may not be as sensitive for the detection of alcoholism in female alcoholics. For example, in a study of over 200 hospitalized Australian alcoholics, MAST scores for men were found to be greater than for women across all categories of drinkers. For both men and women, MAST scores declined with age. For those patients whose alcoholism led to their re-admission to the hospital, MAST scores tended to increase with each admission.⁴

Laboratory Tests

There have been many efforts to identify laboratory screening studies which would identify patients with alcoholism. No single test or series of tests has been found to be conclusive. For those with end-stage alcoholism, many laboratory findings may be abnormal. However, for patients who are

ABBREVIATIONS USED

AA: Alcoholics Anonymous
CAGE: Cut, Annoyed, Guilty, Eye-opener (see questionnaire)
DSM: Diagnostic and Statistical Manual
GGTP: ???
MAST: Michigan Alcohol Screening Test
MCV: Mean corpuscular volume
PMS: Pre-menstrual syndrome

Table 1. DSM IV diagnostic criteria*

Psychoactive Substance Abuse

1. Any of the following have occurred within a 12 month period:
 - a. Recurrent use resulting in a failure to fulfill major role obligations.
 - b. Recurrent use in hazardous situations.
 - c. Recurrent substance-related legal problems.
 - d. Continued use despite recurrent social or interpersonal problems.
2. Has never had the diagnosis of dependence

Psychoactive Substance Dependence

At least three of the following have occurred in a 12 month period:

1. Tolerance to drug effects
2. Characteristic withdrawal syndrome
3. Substance taken in excess of person's intent
4. One or more attempts to cut down
5. Significant time spent obtaining, experiencing effects of or recovering from effects of substance
6. Significant changes in life activities due to substance use
7. Continued use despite adverse life consequences

* Adapted from American Psychiatric Association, 1994

just beginning to experience the negative consequences of their drinking, all laboratory studies may be normal. Thus, an attempt to identify alcoholics based solely on laboratory findings generally results in an under-diagnosis of the problem. The breath analysis for alcohol is one exception to this rule. A patient who presents with a breath alcohol of greater than 100 mg.% (.10 gm %) can be considered to have alcohol dependence until proven otherwise.

For those patients with known alcoholism, laboratory abnormalities which have been commonly encountered include elevated mean corpuscular volume (MCV), elevated liver enzyme levels, elevated uric acid, and increased lipid levels. In one study of 100 previously untreated Swedish women alcoholics, the presence of an elevated MCV identified approximately half of the female alcoholics.⁵ The red cells of menstruating women are more likely to be microcytic because of their on-going blood loss; therefore, enlarged red blood cells may be particularly suggestive of an alcohol problem in women. The Swedish study

found that if the MCV and the GGTP are both elevated, there was a 70% probability of alcoholism in the women in their study. In most cases however, elevated MAST scores detect alcohol problems far more readily than any laboratory screening.⁶

Characteristics of Women Alcoholics

Early studies that attempted to differentiate between male and female drinkers found that men generally began drinking at a younger age than women. A recent Australian study has confirmed this early finding for older women, but for younger women, earlier drinking patterns are emerging. In Australia, women alcoholics over 55 years of age were found to have begun their regular drinking at an average age of 39 years, while similarly aged men had begun their regular drinking at the age of 23.⁷ In an American study of 45 married couples where one of the partners was an alcoholic, the finding of a later onset of drinking for the women alcoholics was also confirmed.⁸

An attempt to identify alcoholics based solely on laboratory findings generally results in an under-diagnosis of the problem.

In the 1990s women's drinking patterns are changing, and the pattern of women's alcohol use will more likely come to resemble male drinkers. In the Australian study, it was found that for women ages 25-34, the average age of onset of regular drinking was 20; for aged matched men, it was 17. A recent American study of college students by the Columbia Center on Addiction and Substance Abuse revealed that 50% of college students binge on alcohol regularly, consuming at least 5 drinks in a single setting. For women college students, the percentage of binge drinkers has increased from 14 to 37% over the last 15 years. The Columbia Center also reported that the percent of college women who deliberately consume enough alcohol to get drunk has soared from 10% in 1977 to 35% in 1993. They found that the consequences of this alcohol use included not only the physical consequences of alcohol consumption, but also the social consequences of college failure, date rape, and sexually transmitted diseases. In this age population, 60% of women who contracted a sexually transmitted disease were under the influence of alcohol at the time of its acquisition.

Because women suffer physical complications of alcohol use after consuming smaller quantities and after shorter periods of

Table 2.—CAGE questions

Have you ever felt you ought to **CUT** down on your drinking?
 Have people **ANNOYED** you by criticizing your drinking?
 Have you ever felt bad or **GUILTY** about your drinking?
 Do you ever need an **EYE-OPENER**?

regular drinking than men do, the change from a late onset of heavy alcohol use to an earlier pattern suggests that women will be encountering more negative consequences of drinking at an earlier age. Furthermore, the earlier onset of drinking coincides with the child bearing years, increasing the likelihood of alcohol-related problems in the next generation in the form of fetal alcohol syndrome.

Special Risks for Women

Studies comparing male and female alcoholics for the incidence of serious medical complications of alcoholism have found that women alcoholics have an earlier onset of complications from their drinking. Even though the women may have begun problematic drinking at a later age, and may have generally consumed less alcohol than the men, the women experienced an accelerated course of medical complications.⁹ It has been estimated that women alcoholics are 2.7 to 7 times more likely to die from the effects of alcoholism than other women, whereas men experience only a 2 to 4 fold increase in mortality secondary to alcoholism.¹⁰ In one study of hospitalized female alcoholics the lifespan of women alcoholics was decreased by approximately 15 years.¹¹

... the percent of college women who deliberately consume enough alcohol to get drunk has soared from 10% in 1977 to 35% in 1993.

Because of these findings, the Royal College of Physicians has suggested that safe alcohol consumption for women is no more than 14 drinks per week, whereas for men the safe amount is 21 drinks per week.¹² The phenomenon that women experience alcohol related problems earlier in their drinking career and as a result of less drinking is called "telescoping of problems" and is a common characteristic found in women alcoholics.¹³ One reason for this telescoping is a lower tolerance to alcohol for women. Because alcohol is distributed in total body water, and the female body has a higher proportion of fat than the male body,

for a given level of alcohol consumption a woman will have a greater concentration of alcohol than a man of equal mass. In addition, studies have confirmed that women have a greater susceptibility to alcohol problems than men even when controlled for body weight. One reason for this is that women have a lower level of activity of alcohol dehydrogenase in their gastric mucosa.¹⁴ Thus, women absorb more alcohol per drink than men do. The liver, brain and other body systems are exposed to greater concentrations of alcohol.

... 60% of women who contracted a sexually transmitted disease were under the influence of alcohol at the time of its acquisition.

Certain health risks associated with alcohol use are specific for women. Alcohol consumption has been associated with an increased risk of breast cancer in several studies, and a meta-analysis of these studies has found a relative risk of at least 1.4 for women who consume two or more alcohol drinks per day.¹⁵ Osteoporosis is a common finding in post-menopausal women, and alcohol has been found to increase the demineralization of bones. Thus, women who drink might be expected to have an increased incidence of hip fractures as well as other fractures. It has been suggested that this association of alcohol consumption and hip fractures has not been causally linked with alcohol consumption and consequent osteoporosis; it might be merely an association between alcoholism and falling.¹⁶ Other problems include an increased susceptibility to cirrhosis and hypertension. Specific obstetric and gynecologic complications associated with alcohol consumption include amenorrhea, irregular menses, severe premenstrual syndromes, infertility, premature menopause, ovarian failure, orgasmic dysfunction, and birth complications including fetal alcohol syndrome.¹⁰

Psychiatric Comorbidity

Research has shown that 10-30% of people presenting for a broad range of psychiatric disorders will have an additional diagnosis of alcohol dependence.¹⁷ Approximately 8-70% of alcoholics, depending upon the researcher, report significant depressive symptoms.¹⁸ In one study it was found that female alcoholics have a higher likelihood of major depression and phobia than a matched group of male alcoholics.¹⁹ It was also found that in contrast to male alcoholics, where most psychiatric disorders occurred subsequent to the initiation of alco-

hol abuse or dependence, major depression and phobic disorders generally pre-date the abuse of alcohol among women. In another study of 301 alcoholic women, a significantly higher percentage of alcoholic women (40.0% vs. 8.8%) reported having made suicide attempts than did an aged matched group of non-alcoholic women. The risk of suicide attempt appeared to be greater in the younger alcoholic women than in the older alcoholic women.²⁰

Women who are hospitalized for alcohol dependence are more likely than their male counterparts to have abuse or dependence problems with other psychotropic agents.²¹ In one study of 518 hospitalized inpatients who met the DSM-III criteria for alcohol dependence, 70% of the women had used psychotropic drugs in the past, frequently in combination with alcohol. Approximately half the women reported use of benzodiazepines. Women were four times more likely than men to have taken antidepressants. There has been further suggestion that alcohol and drug addicted women may have a higher than normal rate of early sexual abuse.²² Our own work has shown that a significant proportion of women in substance abuse settings have experienced significant physical and sexual assault and trauma.²³ The Epidemiologic Catchment Area survey confirmed a higher "dual diagnosis" rate for women; 66% of female alcoholics also had a psychiatric diagnosis whereas only 44% of the male alcoholics were found to have a second diagnosis.²⁴ In practice, therefore, the identification of a hidden psychiatric diagnosis among women alcoholics and, conversely, the identification of hidden substance abuse problems among women with psychiatric disorders, is critical. Particularly in that group of women for whom major depression or other anxiety disorder has predated their substance abuse, failure to treat the underlying psychiatric disorder creates an increased risk of relapse to substance abuse. Combined substance abuse and depression exacerbate the already high risk of suicide among women abusing alcohol.

Treatment Issues

A traditional mainstay of alcohol treatment has been Alcoholics Anonymous. It was founded in the 1930s by two men who had struggled with alcohol. Over the years, the "12 STEPS" were derived to assist members of AA in maintaining sobriety. In its early years, AA was strictly a male domain and the development of a spouse meeting was regarded initially with much suspicion. Recently, AA's steps have been questioned by women. The formulations of the steps

have been characterized as a means "to break down an over-inflated [male] ego, and put reliance on an all-powerful male God."²⁵ In contrast, women with alcohol problems are the product of a society which has socialized them for dependence, lack of healthy ego, and overly-critical superego. Today there are women's AA groups which may assist women in fostering the kind of supports necessary for the maintenance of female sobriety. Additionally, support groups specifically for women, such as Women For Sobriety, have been created to address women's specific needs.

Treatment of the woman alcoholic needs to be sensitive to these issues. Since the alcohol treatment system is generally dominated by men, therapists must be sensitive to transference issues which arise when male therapists treat women who have been victimized by men. Often a female therapist is required for traumatized women. Women tend to be prescribed sedatives more frequently than men. These medications may pose special risk to sobriety and special caution needs to be exercised when considering the use of psychotropic drugs in recovering people.²⁶

Combined substance abuse and depression exacerbate the already high risk of suicide among women abusing alcohol.

One reason why women may have been slow to seek treatment for their alcoholism is that there may be barriers preventing women in particular from seeking help for their problem. As noted above, depression may be more common in alcoholic women, and the hopelessness and passivity of depression may contribute to their inability to seek help.²⁷ Additional factors which may preclude women from seeking help are society's judgments. Many women fear that authorities will put their children into foster care, and therefore do not obtain treatment for substance abuse. Some women may go through an entire pregnancy without medical care because they are fearful of the authorities. Corrigan has found that child protection services were more likely to have removed the children from the home where the mother was an alcoholic, as opposed to the father.¹ Women face increased stigma and reprisal when seeking treatment, and are therefore less likely to obtain needed services. Unfortunately, this reluctance to seek help compromises not only the woman's health but also the health and welfare of her children. Furthermore, the treatment of women must recognize their need to

secure adequate care for their children while they are in treatment. Effective outreach services which can support women in treatment and stabilize home situations may help reverse these trends.

Conclusion

Alcoholism presents a complicated problem in any circumstance. Yet, it appears that the risks of excessive alcohol intake are greater for women than for men. Women appear to be predisposed to an accelerated course of physical deterioration associated with alcohol consumption. Recently, women have begun drinking greater quantities of alcohol and at an earlier age than in the past. This suggests that the incidence of alcohol related disorders among women is

Many women fear that authorities will put their children into foster care, and therefore do not obtain treatment for substance abuse.

likely to increase in the future and that the risk to the next generation associated with fetal alcohol syndrome and the general neglect of children by alcoholic parents is also likely to increase. It is therefore incumbent upon the clinician to be aware that alcoholism is a common problem and needs to be assessed in every clinical interaction. For women the warning signs of elevated MCV, abnormal GGTP, co-existing depression, suicide or para-suicide attempt, and a varied assortment of non-specific complaints such as headache and PMS may suggest an underlying problem with alcohol. If the current trends continue we can expect a public health crisis. Clinicians need to be prepared to identify and treat this pervasive and debilitating disorder.

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Hormone Replacement Therapy: the Latest Findings

Carol A. Wheeler, MD

Menopause, defined as the final menses, is a life event with major impact on both the psychological and physiological aspects of a woman's life. At an average age of 51, a woman with menopause spends as much as one third of her life after the cessation of ovarian function. There is no parallel change in men, and many experts have debated whether this decline in hormone levels is really physiologic or is in fact pathologic. If this is truly pathologic, then the question arises whether replacement of lost ovarian hormones should be considered routine. This paper will examine the current data regarding hormone replacement therapy.

Normal Physiology

As a woman approaches menopause, ovulation becomes less frequent and leads to irregular menses. During this time, the serum follicle stimulating hormone (FSH) begins to increase. Ultimately, the FSH increases 10-20 times and the luteinizing hormone (LH) increases approximately 3 times. This occurs simultaneously with gradual or abrupt cessation of menstrual function and loss of the ovarian follicular supply.

Changes in steroid hormones occur with declining ovarian function. Ovarian estrogen production ceases with menopause, and very low levels of circulating estradiol and estrone result from peripheral aromatization of androgens in adipose tissue. Obese women, therefore, have higher circulating estrogen levels and are less prone to signs and symptoms of estrogen deficiency.

Androstenedione, the androgen secreted principally by the ovary, decreases to one-half of premenopausal levels. The adrenal gland, however, continues to secrete some androstenedione. Testosterone continues to be secreted with minimal change in level by the ovarian stroma postmenopausally under the influence of the pituitary gonadotropins. The total androgen secretion is overall decreased, however.

Impact of Menopause

Symptoms of estrogen deficiency are those that affect both quality of life and life

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expectancy. Those that affect primarily quality of life are vasomotor instability (hot flashes/flushes) and urogenital atrophy. The classic hot flush lasts from a few seconds to a few minutes and involves a sensation of warmth spreading over the face and neck, often accompanied by profuse perspiration. These flushes frequently occur at night, leading to severe sleep disturbances. They are simultaneous with a rise in serum LH, but not caused by LH. Flushes originate centrally, probably in the hypothalamus, and are seen with declining estrogen levels. Fortunately, they generally cease several years post-menopausally, lasting a maximum of five years. Approximately 50-90% of women may experience these disturbing vasomotor symptoms.

Psychological symptoms have also been attributed to estrogen deficiency, but it is difficult to separate these from symptoms caused by the sleep disturbances due to hot flashes. A recent study¹ suggested that estrogen replacement may have a specific beneficial effect on verbal memory, although other studies have failed to demonstrate clear effects.

Symptoms of urogenital atrophy include stress urinary incontinence, atrophic vaginitis, and dyspareunia. These may take years to develop, and increase in severity with increasing years of estrogen deficiency. Women are often uncomfortable discussing these symptoms with their health care provider.

Loss of ovarian estrogen plays a critical role in the development of osteoporosis in women. This is in addition to the age related decline in bone mass. This loss of bone mass can be as much as 3-5% annually for the first 5 years following menopause.² Continued bone loss occurs at a slower rate even into a woman's seventh decade of life. Hip fractures cause significant morbidity and mortality in elderly women.

Cardiovascular disease is the leading killer of women. Data going back to the Framingham study³ suggest that loss of ovarian estrogen, either through natural or surgical menopause, leads to an increased risk of cardiovascular disease. Since that time, over 32 epidemiologic studies have looked at the relationship between postmenopausal estrogen use and coronary heart disease. A protective effect of estrogen on the heart has been demonstrated in varying degrees

Data suggest that loss of ovarian estrogen, either through natural or surgical menopause, leads to an increased risk of cardiovascular disease.

in the vast majority. Clearly, a reduction in cardiovascular morbidity and mortality can significantly impact women.

Hormone Replacement Therapy

During the 1960s and 1970s, concomitant with the introduction of the oral contraceptive, hormone replacement therapy (HRT) became increasingly popular for the treatment of menopausal vasomotor symptoms. Prescriptions for estrogen doubled between 1966 and 1975.⁴ During the 1970s, however, studies began to demonstrate an increased risk of endometrial hyperplasia and cancer in estrogen only users^{5,6} and led to an abrupt decrease in estrogen use. Since then, a better understanding of this relationship between ovarian steroids and endometrial disease (to be discussed later) has led to a steady increase in HRT for a variety of indications.

Quality of life issues often influence the use of HRT for symptomatic treatment. Estrogen is the most effective medical treatment for vasomotor instability. Estrogen also treats urogenital atrophy symptoms, leading to improved sexual function. Stress urinary incontinence is generally treated by a combination of estrogen with various surgical procedures. Even independent of these specific areas, many women find global improvements in quality of life while on HRT.⁷

Since osteoporosis is such an important consequence of loss of estrogen, its effective prevention is critical. Many studies have shown significant reduction of osteoporotic fractures in estrogen users compared to non-users.⁸⁻¹⁰ The minimum dose of estrogen required to provide protection against osteoporosis is the equivalent of 0.625mg of conjugated estrogen.

As mentioned previously, perhaps the most significant impact of HRT is on the prevention of cardiovascular disease. Studies looking at fatal and non-fatal events including myocardial infarction, stroke, and all cardiovascular disease have consistently

ABBREVIATIONS USED

FSH: Follicle stimulating hormone
HDL: High density lipoprotein
HRT: Hormone replacement therapy
LDL: Low density lipoprotein
LH: Luteinizing hormone
MPA: Medroxyprogesterone acetate

shown risk reduction with post-menopausal estrogen use. One of the most important studies demonstrating this risk reduction was the "Nurses Health Study".¹¹ This cohort included 48,000 women followed for 338,000 person-years and showed relative risks for estrogen users of 0.56 for major coronary disease, 0.97 for strokes, and 0.72 for total deaths.

The mechanism of action of estrogen's cardioprotective effect is complex. Estrogen clearly decreases LDL cholesterol and increases HDL cholesterol as demonstrated in many studies.^{12,13} In addition, estrogen appears to have direct vascular effects and may protect against coronary thrombosis and infarction by altering thrombotic mediators. This is critical since the addition of a progestin to estrogen replacement may partially negate the positive impact of estrogen on lipoproteins. Decreasing the dosage and/or altering the regimens of progestin may limit this negative effect.

Cancers and Hormone Replacement Therapy

The findings of increased endometrial hyperplasia and endometrial cancers in unopposed estrogen users led to studies showing that the addition of a progestin could not only offset this increased cancer risk, but possibly lower it to a level less than that of an untreated population.¹⁴ The duration of therapy of the progestin appears to be critical. The incidence of endometrial hyperplasia in patients treated with 7-10 days of progestin is at least 2% but falls to 0% when treatment is extended to 12 days per month.¹⁵ For such periodic therapy, the most widely accepted dose is 10mg of medroxyprogesterone acetate, although one study suggested that 5mg for 11 days may be adequate.¹⁶ The clear consensus is that the risk of endometrial cancer in women treated with appropriate combination regimens is not increased.

The area generating the most controversy surrounding hormone replacement therapy is that of the relationship between post-menopausal estrogen use and breast cancer. Breast cancer is the most frequent malignancy in women and second only to lung cancer in causing cancer deaths in women. Meta-analyses of over 39 studies of the relationship between estrogen use and breast cancer risk showed a small but significant increase in relative risk (1.3, confidence interval 1.2-1.6 and 1.06, confidence interval 1.00-1.12).^{17,18} The studies of the combined use of estrogen/progestin and breast cancer risk are much more limited and variable. This limits the ability to determine the progestin addition effect on relative risk of breast cancer. Clearly, the data

are insufficient based on the current literature. No data are available for the effects of long-term estrogen use specifically in relationship to breast cancer deaths. It is hoped that increased breast cancer surveillance in hormone-replacement therapy patients will lead to early detection and no significant negative impact on breast cancer deaths.

Current HRT Regimens

Estrogen can be delivered by two general methods; oral and non-oral. Non-oral routes include the transdermal patch, creams, gels, injections, and pellets. Most commonly used in the United States are the oral forms, of which the most commonly prescribed are conjugated equine estrogens (Premarin[®]). The major disadvantage of using conjugated equine estrogens is the inability to monitor serum levels of the drug. Natural estrogens such as micronized estradiol (Estrace[®]) and estrone sulfate (Ogen[®]) have the advantage of possible serum monitoring. The third category of oral estrogens includes the synthetic estrogens, such as ethinyl estradiol and diethylstilbestrol. These synthetics have been used primarily for other indications (such as oral contraception) and should probably not be used for post-menopausal hormone replacement because of their greater effect on hepatic metabolism.¹⁹

Non-oral routes such as the transdermal patch (Estraderm[®]), pellets, injections, gels (not available in the US) and transdermal creams (not available in the US) are alternatives. These have the theoretical advantage of bypassing the first-pass hepatic effects seen with the oral route. Absorption and serum levels are excellent. Transdermal patches are effective in preventing post-menopausal osteoporosis²⁰ as well as providing beneficial lipid effects.²¹ These preparations are an alternative for those not desiring oral treatment although less epidemiologic data are available regarding long-term use and impact on cardiovascular disease.

Vaginal estrogen cream use is popular in patients whose primary symptomatology relates to urogenital atrophy. It is not a good long-term alternative to oral or transdermal estrogens, however, because of variable absorption patterns and imprecise dosing.

Progestin replacement in the US consists of two major groups of synthetics as well as natural progesterone. Natural progesterone is available as an injection, suppository or, more recently, a micronized oral preparation. Its use in postmenopausal hormone replacement has been limited.

More commonly utilized in HRT for endometrial protection are the synthetic progestins. These consist of 19-nortestoster-

one derivatives (such as norethindrone acetate (Norlutate[®]) or 21-carbon progestins (such as medroxyprogesterone acetate (Provera[®])). These have androgenic effects as well as progestational effects in varying degrees. The 21-carbon progestins have the least adverse effect on lipids, and generally have been used in HRT, particularly in the US. The 19-nortestosterone derivatives are used more in Europe. Progestin's side effects include breast tenderness, bloating and depression. These limit their desirability from the patient's perspective.

The other hormone sometimes replaced in HRT is testosterone, particularly in women who have had bilateral oophorectomies. No minimum dose has been established although higher doses have unpleasant androgenic side effects in addition to adverse lipid effects. Methyl testosterone is available in combination with conjugated equine estrogens (Premarin with Methyl testosterone[®]) or esterified estrogens (Estratest[®]). The addition of methyl testosterone may be particularly beneficial for the patient who has loss of libido. The effects of the androgen on mood and quality of life are not clearly defined as of yet.

Choice of specific treatment regimens for HRT are numerous. Unopposed estrogen was traditionally given for 25 days per month in the hopes of limiting the incidence of endometrial hyperplasia, but this was not supported by data in the literature. Currently for patients *without* a uterus, standard practice is to give a daily dose of estrogen with no medication breaks (most commonly conjugated estrogens 0.625mg daily). If a woman *with* a uterus chooses to take unopposed estrogen to avoid progestin treatment and its side effects, she should at the minimum have a baseline and annual endometrial biopsy as well as report any bleeding to her practitioner.

Patients placed on estrogen and progestin combined therapy are generally treated with one of two regimens. The classic regimen involves daily estrogen treatment and monthly progestin treatment for a period of 12-14 days, usually days 1-12 of each month. Some regimens have used estrogen days 1-25 of each month with progestin added days 13-25. Some patients with this latter regimen will experience return of estrogen deficiency symptoms in the non-estrogen days. Approximately 80-90% of women will experience withdrawal bleeding during the days following progestin discontinuation. This side effect becomes less desirable to women as they continue on therapy for extended years. The most common dosages employed in these sequential treatments are 0.625mg of conjugated estrogens and 10mg of medroxyprogesterone acetate (MPA).

Some additional recent data suggest that 5mg of MPA may be adequate to prevent hyperplasia.²² Alternatively, using the progestin only quarterly appears to be sufficient for endometrial protection in a recent study.²³ This study involved daily conjugated estrogens (0.625mg) with 14 days of 10mg of MPA every 13 weeks. Menses tended to be heavier, however, with this quarterly regimen.

As an alternative, continuous combined estrogen-progestin HRT has become more popular to minimize undesirable bleeding and induce amenorrhea. The goal is to induce an atrophic endometrium and minimize negative impact on lipid profiles. Generally, 2.5mg or 5.0mg of MPA is combined on a daily basis with estrogen. The major disadvantage of this regimen is the unpredictable bleeding pattern in the first year. During the first 3 months of treatment, anywhere from 18-93% of patients may experience bleeding.^{24,25} A recent multicenter study evaluated 1,724 postmenopausal women on 1 year of HRT in various combinations.²⁶ Conjugated estrogens (0.625mg) taken continuously with either 2.5mg or 5.0mg of MPA led to amenorrhea in months 7-13 in 40% and 50% of patients, respectively. In another study, after one year of treatment, 95.1% of patients were found to be amenorrheic.²⁷ The most difficult challenge in patients on this combined regimen is determining when the bleeding is of concern and requires further evaluation. In addition, the patient must be counseled that this irregular bleeding may occur and that continued compliance with treatment is critical. Some have advocated combined treatment 5 days a week (Monday through Friday) to try to limit bleeding and side effects but no long-term data are available for this regimen.

Future Concerns and Directions

Studies such as the Women's Health Initiative are needed to establish the long-term risks and benefits of HRT. Does the negative impact on lipids of progestins affect significantly the cardiovascular benefit? If so, is monitoring for endometrial abnormalities with periodic sampling sufficient to permit treatment with estrogen alone?

Compliance with long-term HRT is a major problem. We need to minimize side effects such as bleeding to maintain use over the long-term. The length of time needed to maximize benefits of HRT therapy is also unknown. Cardiovascular benefit persists for duration of treatment, but there is controversy over the value of placing women in their 70's and 80's on hormones. How do we as clinicians decide?

The role of androgens in HRT is not well understood. Studies in this area are ongoing. Other areas, such as HRT for women with a history of breast cancer, are very controversial but of great importance to individual women trying to balance quality of life issues.

Who should be placed on HRT? Several recent decision analyses have attempted to determine this for the population.^{28,29,30} Two of these concluded that the benefits of postmenopausal HRT exceed the risks for all, while the third clearly recommended HRT for women with a hysterectomy or at high risk for coronary heart disease. The clinician needs to discuss freely and at length with the patient her individual risk-benefit ratio and make a joint decision with her as to the most rational treatment course. Open communication will help increase compliance with whatever regimen is ultimately chosen.

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The Women's Health Initiative Clinical Trial and Observational Study: History and Overview

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This manuscript has two objectives. The first is to focus on clinical trials as an important means of testing treatments for diseases whose causes have been clarified by research performed across a wide spectrum of research activity. The second is to introduce an important epidemiologic study and clinical trial that will have a major impact on the health of the American public in the future.

Clinical Trials

Basic research is conducted at various levels, from the molecular and cellular to the behavioral and cultural, and focuses on mechanisms. Clinical research, in comparison, focuses on efficacy, usually at the level of organs and organisms, but also at the level of behavior and culture. Demonstration research focusses on effectiveness, usually at the level of behavior and culture.

Clinical trials represent a challenge and an opportunity. Many are costly in resources. Accordingly, it is sometimes difficult to

decide whether or not to field a trial. Several elements affect this decision. Has the intervention been judged to be efficacious and effective? If so, the trial may yield important results with moderate numbers of participants. If not, huge numbers of participants may be needed. A small trial is less costly and thus more likely to be fielded. An important additional consideration is whether or not the disease incidence or prevalence is high in the relevant population. Impacting a disease of high prevalence may have a large effect, and weigh in favor of initiating and conducting the trial. Finally, is the outcome important? If it is only of slight importance to the public health and welfare, then the cost of the trial may not be justifiable, while if the outcome is very important, the trial may well be judged to be justifiable

The available data for women have led researchers to hypothesize that some of the disease that afflicts post-menopausal women may be prevented.

and affordable and, in effect, a go! This type of decision making process is an integral part of most, if not all, clinical trials.

Another important consideration in the design, and particularly the interpretation, of clinical trials is their generalizability to other populations. In any population selected for study, there is usually a subgroup of individuals who have the disease in question. The subgroup may contain males and females, and ethnic minority and majority segments of the population. Only some of those who have the disease in question are approached and solicited by the trial. Only some of those are eligible and willing to participate. (This suggests the risk of "healthy volunteer" bias). Members of a small subgroup may be randomized to the trial. Some may prove noncompliant or migrate away from the site of the trial. As a result, only a small subset of that group may complete the trial. To whom, then, can one

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apply the trial results? Strictly speaking, only to those who completed the trial in sufficient numbers to yield statistically meaningful results. If one studied males exclusively, could one extrapolate to females? If one studied whites primarily, could one extrapolate to blacks? Any extrapolation is fraught with increasing uncertainty, the further one moves from the population studied. This, of course, is a powerful rationale for including subjects of both genders and of all ethnic and cultural subgroups in clinical trials.

Women as Participants in Clinical Trials

The extensive epidemiological data base for cardiovascular disease has been derived from the Framingham study,¹ the Seven Countries Study,^{2,3} the MRFIT study,⁴ and will be augmented by the Cardiovascular Health Study⁵ and the Atherosclerosis Risk in Communities study.⁶ Most of these data, however, relate to men. A notable exception is the Framingham study.¹ Another is the U.S. Nurses' Health Study^{7,8} which has been productive of some very important information about women.

In trials preventing risk or disease relevant to high blood pressure, the Veterans Administration Cooperative Trial⁹ and the Hypertension Detection Follow-up Program¹⁰ have made major contributions. The Systolic Hypertension in the Elderly Program¹¹ has contributed, as well. Again, the majority of the participants in these clinical trials has been male.

Efforts to prevent progression of disease

ABBREVIATIONS USED

DNA: Deoxyribose nucleic acid
HDL: High density lipoprotein
HRT: Hormone replacement therapy
LDL: Low density lipoprotein
MRFIT: Multiple risk factor intervention trial
WHI: Women's Health Initiative

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have included a number of angiographic trials, again largely with a male focus. Finally, trials to prevent death have been numerous. Once again, women have been excluded from many of these trials. Yet, there has been progress. A great deal is known not only about preventing disease in women, but also about preventing disease progression and death.

Where are the gaps? The clinical trial history just reviewed has systematically underrepresented women. Women have not experienced the same benefit as men from this important research tool. And yet, we know a significant amount about women. The U.S. Nurses' Health Study¹² demonstrates that the rate of coronary heart disease increases steadily with age, and similarly increases steadily as a function of the number of cigarettes smoked per day, with the rates being highest in the older population who are heavy smokers and, of course,

Observational data from international studies have also raised questions about whether a low fat, high fiber diet may have a beneficial effect on breast or colorectal cancer.

lowest in the younger, never-smoking population. Similar information is available for hypercholesterolemia and hypertension.

We also have a substantial understanding of death rates in women. The proportion of deaths from coronary heart disease increases substantially as each age decade passes.¹³ Conversely, the proportion of deaths caused by breast cancer declines while the proportion of deaths caused by colorectal cancer virtually plateaus over the decades 50-59, 60-69, and 70-79. These three diseases cause about 30% of all deaths in women ages 50-79.

Another important health issue for women is osteoporosis, which afflicts women with bone loss beginning with menopause. The rate of loss slows down after ages 50-59, but continues through the life of most women, and is associated with a high rate of hip fractures, a higher rate than observed in men.

Menopause is an important event in the life of a woman. It is at this time that disease rates, particularly of osteoporosis, fractures, and coronary heart disease, but also of breast and colorectal cancer begin to increase.¹³ These highly prevalent, important diseases are ripe for clinical trial.

The available data for women have lead researchers to hypothesize that some of the disease which afflicts post-menopausal women may be prevented. For example,

estrogen replacement may attenuate coronary heart disease. It is known that estrogen replacement decreases LDL cholesterol levels and increases HDL cholesterol levels by about 15%.¹⁴ Several studies have suggested a reduced coronary heart disease risk among women on estrogen replacement, but most of this research has been observational and is therefore fraught with potential for misinterpretation.¹⁵ A limited number of cross-sectional angiographic studies have suggested reduced severity of coronary atherosclerosis among women on estrogen replacement.¹⁴

Case control data from Olmstead County, Minnesota¹⁶ indicate that women who develop myocardial infarction or sudden unexpected death are much more likely to be smokers than control subjects. Similarly, these women are much more likely to have hypertension and diabetes. Although not quite statistically significant, controls in this study had a greater likelihood than cases to have been taking estrogen replacement. These data are consistent with the hypothesis that estrogen replacement protects against myocardial infarction and sudden death. On the other hand, data from the Framingham Heart Study¹⁷ on women ages 50-59, 60-69, and 70-83 showed that postmenopausal estrogen users had slightly and insignificantly higher rates of developing cardiovascular disease than post-menopausal non-users. Thus, available data conflict, illustrating a typical problem with observational or case-control studies.

Derby et al.¹⁵ reported on 2200 postmenopausal women, 39% of whom had experienced natural menopause and 28% surgical menopause. They compared women who were taking estrogen replacement therapy at the time of the study with those who were not, and observed that women at or above the 75th percentile of the HDL distribution were more likely to be using estrogen than women at or below the 25th percentile. The difference may have existed before estrogen replacement, or may have been caused by it; the cross-sectional design could not be used to distinguish between these two explanations. Findings also showed that women who were in the lean part of the body mass index distribution were more likely to be taking estrogen than those in the overweight part of the body mass index distribution. Estrogen may have helped women stay lean, or lean women may have been more likely to use estrogen. Again, the study design could not be used to distinguish between these two explanations. Similar data were also found for smoking and sedentary lifestyle. The findings indicate the need for a controlled trial of hormone replacement therapy.

Honest, scientifically valid uncertainty persists about the virtues of long-term estrogen replacement therapy. Similar uncertainty exists about the use of progestin with estrogen replacement.¹⁸ As we have observed, the existing observational study results may be confounded by self-selection bias. There is also a need to assess the potential risks of hormone replacement therapy. In short, the coronary heart disease / estrogen hypothesis is ripe for a clinical trial.

Observational data from international studies have also raised questions about whether a low fat, high fiber diet may have a beneficial effect on breast or colorectal cancer. There are no reliable pre-clinical disease markers for these cancers and substantial differences of opinion persist on these questions. As we have discussed with reference to hormone replacement therapy, case control and observational studies have major limitations. The background of the dietary modification hypothesis is extensive and includes experimental animal studies and studies of international migrants, as well as case control studies and cohort studies.¹⁹

A third major disease afflicting women

Any adverse or newly detected events in this trial will be promptly referred to a woman's personal physician for care.

is postmenopausal osteoporosis. This disease results in a major economic burden to our nation.

Here, then, are three major issues, coronary heart disease, breast and colorectal carcinoma, and osteoporosis, where valid hypotheses exist, where public health implications are enormous, and where a clinical trial is the appropriate next step in the research spectrum.

The Women's Health Initiative

The Women's Health Initiative (WHI) is such a clinical trial. This trial of 63,000 women will address major causes of morbidity and mortality in postmenopausal women. A parallel observational epidemiologic study will follow a cohort of 100,000 women over nine years, to help us predict who will develop coronary disease, breast or colorectal cancer, and fractures, and who will die as a result. It will help us create a resource of data and biologic samples, including DNA, to be used to uncover new risk factors and biomarkers for diseases. Using storage facilities for sera and DNA samples, it will be possible to answer questions which originate after the clinical trial

Table 1. Sample size determination; hormone replacement therapy: 25,000 women ERT vs. placebo, PERT vs. placebo

Disease	% Reduction in Incidence	Statistical Power (%)	
		ERT	PERT
CHD	25%	77%	76%
	30	91	90
Hip Fractures	30	76	74
	35	88	86

has been completed. Finally, this observational study will permit examination of the impact of changes in individual characteristics on disease and total mortality rates. The observational study should support and generalize the findings of the parallel clinical trial, identify new risk factors and patterns of risk for specific disease, and finally, generate new hypotheses to be tested in subsequent clinical trials.

As is shown in Figure 1, the clinical trial is based on a three by three by two factorial design. The first arm of the design is hormone replacement therapy (HRT), the second concerns dietary modification, and the third involves calcium and vitamin D supplementation.

The hormone replacement trial will initially involve 32,000 women, stratified by whether or not a uterus is present. If the uterus is present, estrogen, progestin plus estrogen, or placebo will be administered by random allocation according to the proportions shown in Figure 1. If a uterus is absent, estrogen or placebo will be administered. The primary outcome is coronary heart disease. Secondary outcomes may very well be cancer and, of course, osteoporosis. Each of these outcomes will be tracked throughout the trial.

The diet modification arm has, as its primary outcome, breast and colorectal cancer, although coronary disease is hypothesized to be influenced favorably, as well. The women will be randomly allocated to usual diet or to a diet with 20% or fewer calories from fat.

The calcium-vitamin D arm will focus on the prevention of osteoporosis and hip fractures. Colorectal cancer rates may also be favorably influenced by the administration of calcium. Women will be randomly allocated to receive calcium and vitamin D or a corresponding placebo. All women must be in at least one of the two left-hand arms shown in Figure 1; all are subsequently eligible to enter the calcium-vitamin D arm.

Conjugated equine estrogens is the primary medication selected for the HRT arm. Women in the progestin arm will receive supplementation of medroxyprogesterone.

The third group will receive a placebo. All side effects will be monitored closely, including vaginal bleeding, endometrial hyperplasia or cancer, and adverse effects in breast tissue.

The sample size for each of these arms is based on hypothesized reductions in incidence. As discussed above, trial size is dependent on the difference in event rates anticipated among women in different intervention arms. For coronary heart disease with estrogen replacement, there is ample statistical power in the estrogen replacement arm and the progestin estrogen arm. There is also ample statistical power to detect decreases in hip fracture rates, as show in Table 1.

The dietary modification arm has, as its primary intervention, to decrease total fat-calorie derivation to 20% or less. An ancillary goal is to reduce saturated fat calories to less than 7% of all calories. Corollary changes in eating patterns will include increases in complex carbohydrates, fruits, vegetables and grain products. The nutritional adequacy of this diet will be monitored with food frequency questionnaires throughout the trial. 48,000 women will be enrolled in this trial. Sufficient statistical power exists to detect modest reductions in breast cancer, colorectal cancer, and coronary heart disease.

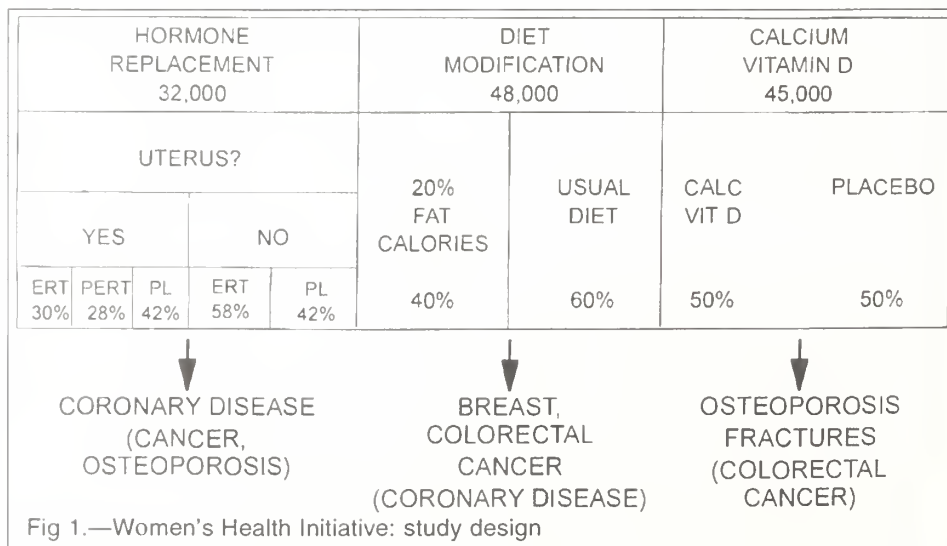
The calcium-vitamin D arm will use cal-

cium carbonate supplemented by 400 international units of vitamin D-3. The remainder of the women will receive placebo. Symptomatic renal calculi will be monitored. The sample size for this arm provides adequate statistical power for hypothesized changes in hip fractures and colorectal cancers.

The clinical trial and the observational study will carefully characterize each of the participants in the trial. Psychosocial variables such as depression, cognitive functioning, and physical functioning will be assessed. Life events, social functioning, and health perceptions will also be assessed.

To be enrolled in the trial, a woman must be between the ages of 50-79 and postmenopausal. Most importantly, she must be eligible and willing to participate in either the hormone replacement arm, the dietary modification arm, or both. Using these eligibility criteria, most women can subsequently opt to enter the calcium-vitamin D arm of the trial or not.

Each interested woman will receive an invitation to enter the trial. She will undergo prescreening for medical history, food frequency, and many other variables. Judgment of eligibility will lead to a first examination visit for blood samples, selected measurements, and questionnaires. Women willing to enter the trial will be invited to enter either the hormone replacement arm, or the dietary modification arm, or both. They will undergo selected examinations including, for example, for the dietary modification trial, breast examination, and for the hormone replacement trial, gynecological examination. They will be assessed for compliance. During a third visit, their eligibility for randomization to the hormone replacement arm and the dietary modification arm will be assessed. Women not willing or eligible for the clinical trial may be invited to participate in the observational



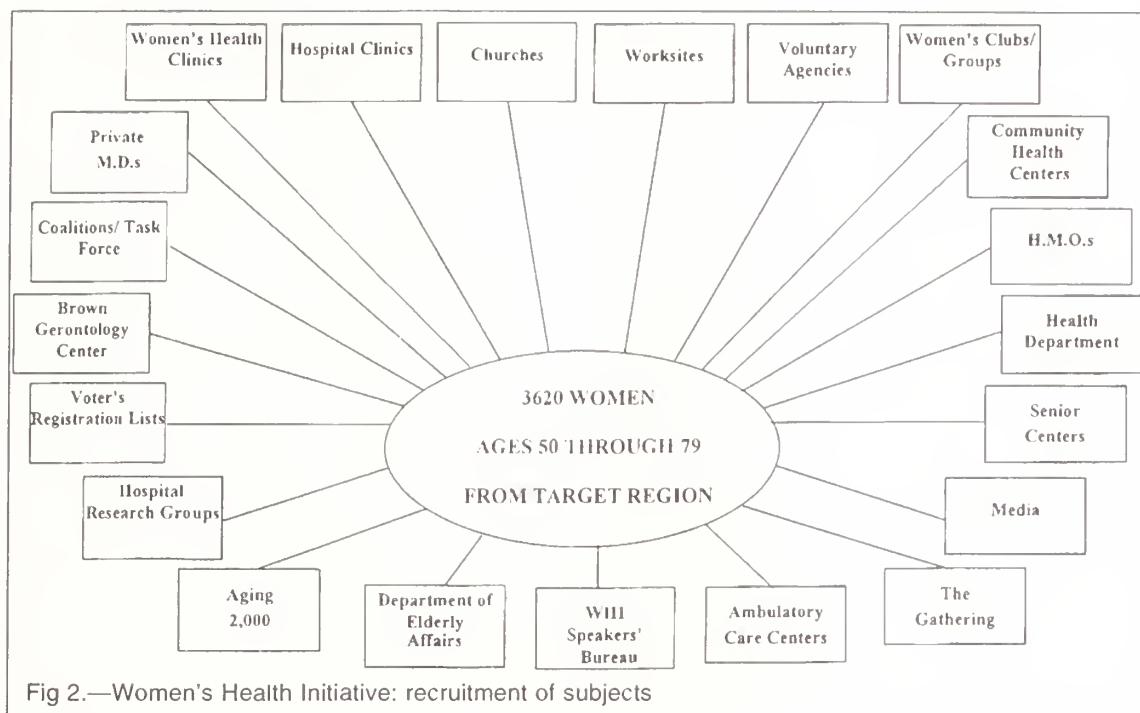


Fig 2.—Women's Health Initiative: recruitment of subjects

study. All women will subsequently undergo annual or triennial follow-up with careful tracking of all disease events.

This trial is in its very early phases. 16 Vanguard Clinical Centers have been established across the U.S. 29 additional centers will be added in Fall of 1994. The Rhode Island Vanguard Clinical Center has successfully recruited women for the past year through physician's offices, women's clubs, and the WHI statewide coalition of over fifty agencies (see Figure 2). This coalition is co-chaired by Dr. Barbara DeBuono, director of the R.I. Department of Health, and Claudine Schneider, former U.S. Congresswoman from R.I. The recruitment phase of the study will last for three years, after which there will be approximately nine years of follow-up (through 2004). After 29 centers are added to the study, three study phases will ensue: "close-out," data analysis, and conclusions.

Any adverse or newly detected events in this trial will be promptly referred to a woman's personal physician for care. It is important to note that this clinical trial is a research endeavor and not a care giving endeavor. The role of each woman's personal physician is key to the success of the trial and to the health maintenance of women in the trial.

Women's health, while not totally neglected in the past 50 years, has not received the focus it deserves. The Women's Health Initiative Clinical Trial and Observational Study seeks to close the gender gap in research, and to improve the health and welfare of a critically important segment of our population. In Rhode Island, research-

ers from Memorial Hospital, Women and Infants Hospital, Rhode Island Hospital, Brown University, and the University of Rhode Island are working together with over 3,000 women and their physicians to make this dream a reality.

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Concepts For A Medical School Curriculum On Women's Health

Lynn C. Epstein, MD and Debra B. Abeshaus, BS

Since men and women are not identical psychologically, anatomically or physiologically, such differences must be factored into any treatment regime.

Recognition of the need to pay special attention to issues of gender in the provision of health care is a relatively new phenomenon.^{1,2} The roots of today's movement towards a curriculum on women's health might well be traced back to 1915, when Dr. Bertha Van Hoosen called a meeting of a group of individuals to discuss their common goal of mobilizing women physicians at the national level. From these deliberations, the Medical Women's National Association, the forerunner of the American Medical Women's Association (AMWA) was formed.³ The organization started by Van Hoosen and colleagues evolved through many stages over the years, and in time, offered women in medicine a voice to advocate collectively for greater access to medical education, to increase arenas in which women provided care, and to converge attention on women's health care.

Historically, the medical profession framed "women's health" as those diseases or conditions that affect the female reproductive system.⁴ More recently, there has been a growing awareness that the etiology, course and treatment of general diseases can differ significantly in women.^{1,5} Ironically, research studies specifically excluded women as participants based on concerns that their hormonal factors would interfere with findings. It was only in 1991, under the leadership of Dr. Bernadine Healy, that the National Institutes of Health (NIH) issued guidelines requiring inclusion of women in NIH funded protocols other than those addressing illnesses unique to men, eg, prostate cancer.⁶ When the Office of Research on Women's Health was established at NIH the preceding year, mandates were set, to stimulate research on diseases in women, to require inclusion of women in research protocols; to increase opportunities for women in biomedical research.⁹ Dr. Healey and the Office played a major role in

launching the \$625 million, 14-year NIH longitudinal study, the Women's Health Initiative (WHI), the largest Federally funded clinical trial in the United States.⁸

Understandably, these changes are part of prominent, national demographic shifts: the percentage of working women has burgeoned so that more women are in the labor force than at home; women comprise a significant and expanding portion of the work force.^{10,11} Major modifications in women's roles have led to a reexamination of attitudes towards them. Similarly, women have assumed a more active role in seeking and evaluating the services they need.

Today, the need to consider gender differences in the establishment of the doctor/patient relationship is becoming more apparent. Women's attitudes about their health, preferred provider style, psycho-social needs, etc. should be addressed to maximize effective care. Exploring biases about women as patients and as providers is essential to ensuring that appropriate treatment is offered and patient collaboration obtained. This paper will give an overview of what is being done in medical education to address "Women's Health" and what innovations are warranted.

Overview of What Is Currently Available in Women's Health

The training of medical students has traditionally focused on the mastery of knowledge domains and the acquisition of appropriate clinical skills. In a comprehensive review of medical training, the Association of American Medical Colleges' Project on the General Professional Education of the Physician published the findings and recommendations developed by its working groups.¹² The report outlined the need for students to develop personal qualities and attitudes, in addition to the essential knowledge and fundamental skills. In a general way, these recommendations, along with similar guidelines from other professional organizations and specialty groups, led to a renewed emphasis on the doctor-patient relationship and the relevance of empathy.¹³ Within this context, the exigency for sensitivity to issues of diversity among patients emerged (eg, race, class and gender).

With heightened awareness came the realization that the requirements of these populations were not being adequately addressed. It has been unclear how the responsibility and oversight for these areas would be carried out within the structure of the medical school.

The programs and offices for minority or for women's affairs established at some medical schools are primarily charged with enhancing the educational environment and promoting the advancement of their students. Curricular issues are generally governed by some combination of administrative mandate and faculty committees, with involvement of deans and/or department chairs. Within this framework, health for women is typically relegated to obstetrics and gynecology, leaving the broader aspects in the margins.

During the past few years, some institutions have designed new residency and fellowship programs to meet the need for continuity in health care for women. At Albert Einstein College of Medicine, the departments of internal medicine and obstetrics and gynecology have initiated a residency track, which will prepare graduates for the practice of general internal medicine with a particular focus on the care of women. In addition, residents will be trained for teaching and research in this special area.

At Rhode Island Hospital (RIH), the Division of General Internal Medicine has created three fellowship tracks, one of which is in women's health. The Women's Health Track has a clinical and research component, as well as ones in administration, teaching and professional development. The program includes work at two teaching hospitals, RIH, where the program is based, and the adjacent Women and Infants Hospital. The women's health postdoctoral fellow sees patients in the Medical Primary

ABBREVIATIONS USED

AMWA: American Medical Women's Association

NIH: National Institutes of Health

PLME: Program in Liberal Medical Education

RIH: Rhode Island Hospital

WHI: Women's Health Initiative

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Care Unit and at Women's Health Associates, a hospital-based clinical practice. Fellows also conduct a related women's health research project.¹⁴

The most innovative effort yet in a women's health curriculum is the American Medical Women's Association's (AMWA) Continuing Medical Education program to retrain physicians utilizing a model that encompasses various phases of the woman's life cycle.¹⁵ Part I: "The Mid-Life (40-64) and Mature Years (65-79)" was offered in the Fall 1993; Part II, in October, 1994, covers "The Early Years (birth-18), Young Adult Years (19-39) and Advanced Years (80 and Beyond)." The program emphasizes the phases of the life-cycle, in contradistinction to the traditional organ system and disease model. In so doing, participants gain a sense of the continuity of important developmental areas (in health and in illness) over time. Each module has nine major content areas: Sexuality & Reproduction; Women & Society; Health Maintenance & Wellness; Violence & Abuse; Mental Health & Substance Abuse; Transitions & Changes; Patient/Physician Partnerships; Normal Female Physiology; and Abnormal Female Physiology.

The Medical College of Pennsylvania recently received a grant from the Fund for the Improvement of Post-Secondary Education to explore ways to bring women's health more effectively into all phases of medical education and training.¹⁶ In March of 1994, MCP and the AMWA brought together interested physicians, educators, women's health advocates, and organizations by creating the National Academy of Women's Health Education. The academy plans semi-annual meetings to share information and strategies with the intent of developing guidelines for teaching and assessing appropriate content, skills and attitudes in the health care of women.

The percentage of working women has burgeoned so that more women are in the labor force than at home.

The programs inaugurated by the institutions and organizations noted above illustrate two emerging pathways for dealing with the curricular void in women's health: one is to create training programs designed for specialists; the other is to integrate issues of gender more broadly throughout medical education and specialty training. While progress is being made on both fronts, debate as to whether a separate specialty is the best strategy continues, and a definitive resolution has yet to be reached. Moreover, decisions about specialty affiliation need to

be resolved. Both internal medicine and obstetrics and gynecology have been mentioned as permanent sponsors for a women's health specialty.^{2,4} Since these two disciplines have collaborated to initiate women's health training programs in specific venues, it seems counterproductive to isolate departmental efforts. Along parallel lines, having a women's health specialty does not supplant requirements for physicians in all specialties to learn about women's health. Thus, while some medical practitioners are developing special expertise in the care of women, all practitioners need to understand the contributions of gender to medicine.

Overview for A Curriculum in Women's Health Care

The 1991 NIH guidelines called attention to the fact that our knowledge and teaching about general medical illnesses, based on research with male subjects, may be deficient or even incorrect when applied to women patients.⁸ As data from new studies are gathered and analyzed, the results will be incorporated into classroom teaching. In the meantime, alerting medical students to these potential gender differences is essential.

Planning a curriculum in women's health requires a comprehensive approach, which occurs both within and across disciplines.⁴ The parameters need to be defined, a model for integrating the knowledge base determined, and strategies for implementation devised. An analogy has been made between the field of geriatrics and the needed structure for women's health care. Both fields work with specific patient populations and address areas that cross disciplinary boundaries. In addition, in neither instance does the existence of specialists in the field obviate the necessity for all physicians to be able to provide care to the target group.⁶ A somewhat different model emerges in a comparison between pediatrics and women's health care, since pediatrics as a discipline exists as a qualifier for many other specialties, eg., pediatric psychiatry, pediatric surgery, and pediatric infectious disease.

In designing an academic program for the medical care of women, three general and overlapping domains can be identified: (1) Diseases or conditions that solely or primarily affect women, eg., diseases of the female reproductive organs, osteoporosis, domestic violence; (2) Gender differences in the etiology, course, and treatment of diseases, including life cycle issues, eg, heart disease, autoimmune diseases, AIDS, cancer; (3) Gender differences affecting the establishment of the doctor-patient rela-

tionship and biases about women as patients, eg., different attitudes by women about their illnesses, preferred provider style, likelihood of consulting a physician, receiving aggressive treatment and the importance of psychosocial needs and trust. Of these categories, all medical curricula currently include coverage of the structure, function and diseases of the female reproductive organs, and to a lesser extent, of those diseases and conditions that disproportionately affect women.

At Rhode Island Hospital, the Division of General Internal Medicine has created three fellowship tracks, one of which is in women's health.

In each course or clinical rotation, the differential findings and requirements relating to gender should be explored. In the process, students would realize the important implications gender differences have for providing appropriate care. For example, symptoms of abdominal pain in women obviously can have different implications than the same symptoms in men. Another common issue with gender implications is the need for women to have sufficient calcium intake throughout the life cycle to prevent osteoporosis. Yet a third example is the importance for women patients to be given appropriate and aggressive care in the treatment of cardiovascular disease.

The next step is to assist students to integrate what they learn across disciplines and to emphasize longitudinal aspects of women's health care. For women's health, just as for other curricular topics, it is imperative to piece together the information and insights from each bio-medical discipline to arrive at an accurate picture.

One of the major aims of a medical school curriculum on women's health is to provide students with a conceptual framework around which they can unite the specific facts they are learning. For any given patient's situation, the current episode requires the perspective of how it fits with the individual's overall development. Once a sense of the life cycle has been mastered, students will have a better appreciation of the opportunities for preventing illness at different developmental stages. It is important to discuss with patients their understanding of what is happening to them, to educate them about possible implications and options, and to enlist their cooperation in the treatment plan. With a better conception of the overall process, patients are more likely to accept necessary modifications in their regimens.

Courses on patient interviewing and physical diagnosis provide important opportunities to augment students' sensitivity and responsiveness to gender differences in professional relationships. By emphasizing the need to modify one's approach to accommodate issues of diversity (race, class, gender), these courses help students become attuned to the necessity of so doing in all patient encounters. Once consideration of gender is routinely part of the equation, the challenge for the student is to further individualize patient interactions to address personal differences.

Both internal medicine and obstetrics and gynecology have been mentioned as permanent sponsors for a women's health specialty.

The strategic placement of courses in introductory clinical skills early in the medical school years permits students to use them subsequently when on the discipline specific rotations. As students rotate through their clerkships, whether or not they continue to build their skills in customizing their interactions with patients depends in large measure on what they see the faculty do (as well as teach), hence the importance of ensuring adequate attention to gender differences throughout the continuum of student, resident, faculty.

The notion that women have different needs and expectations vis-a-vis the doctor-patient relationship has important implications for their medical care. While some might argue about the necessity for doctors to change their style to accommodate patient differences, few would argue about the need for establishing a therapeutic alliance. There is a large body of work on women's psychological development using a relational model as opposed to the many archetypal models. Gilligan emphasizes the importance of women's sense of "connection" and personal "voice" in relating to others and in handling situations. Her theoretical construct can be extended into the scope of the relationship between the doctor and female patient with the goal of strengthening the partnership between the two.¹⁷ Since men and women are not identical psychologically, anatomically, or physiologically, such differences must be factored into any treatment regime.

Another consideration in the doctor-patient relationship is the role of physician gender. It has been suggested that women physicians sometimes take a different approach to patient care: generally spending more time and focusing on the relationship. This often allows for greater sharing on the

part of the female patient, ultimately facilitating treatment.¹⁸ Suffice it to say with more women in medicine, we anticipate that physicians of both genders will have exposure to different clinical styles and may adopt new modalities based on patient preferences.¹⁹

In an analogous manner, with increasing numbers of women medical students and doctors, it would be productive to include courses to acknowledge and sensitize students and faculty to issues of sexual harassment. In order to make progress in this area, all participants must share responsibility for professional behavior. Rules and their strict enforcement have limited value without peer support. Harassment is an abuse of power and can impede doctor/patient relationships. A less well-publicized subset of this can occur when female doctors are harassed by male patients.²⁰ Wherever, and in whatever form it occurs, harassment has a deleterious affect on professional relationships, between teacher and student, among colleagues, and between doctors and patients. Given the above, it is incumbent on medical schools and training programs to acknowledge, address and institute programs to maximize an optimal environment for learning and for patient care.

Discussion of women's health would be incomplete without commenting on the surge of medical students and trainees who are women. Understandably, women students and physicians reinforce the interest in women's health research and patient care, and bring a somewhat different perspective to women's treatment. As more women obtain substantial leadership roles in the profession of medicine, they will have opportunities to advance the agenda for women's health research and patient care.^{5,21}

In the same manner, it is anticipated that the new wave of women moving into elected governmental positions will have positive effects on women's health. For instance, Representative Nita M. Lowey (D-NY) created a legislative provision that the US Department of Health and Human Services examine what exists currently in medical education curricula pertaining to gender in health, disease and research.²² Also, she proposes the idea that teaching of women's health be measured as a criterion in the accreditation of medical schools and residency programs, as well as in licensure. Such a move would have enormous influence on medical training and curricula, just as NIH's requirements for inclusion of women in research protocols did for biomedical research. This kind of strong message is what many women's health advocates are calling for at this time.

Finally, there is need for a core curricu-

lum in women's health, one that would creatively build on content and paradigms from other disciplines. Johnson and Cain speak about the "scholarship of integration," and a model based on women's developmental stages, that brings together content from many disciplines and uses pedagogical innovations.⁴ Once again, in weaving women's health throughout the spectrum of medical disciplines, students will have frequent exposure to gender differences in providing patient care for each specialty. Dr. Bernadine Healey advocates that administrators and institutions review their training programs with regard to gender differences and states: "All medical students, male and female, (need) to understand the biological differences between the sexes, to take the time to listen to their patients, to respect their patients' concerns and anxieties, and, most of all — ...to take them seriously."¹

Conclusion

Assuring that medical curricula and training programs adequately encompass issues in women's health requires a comprehensive approach. It includes not only physiological conditions or diseases, but also their differing manifestations, course and treatments, based on gender. Moreover, gender differences must be considered in establishing rapport between provider and consumer. The resulting doctor-patient relationship plays a critical role in the formation of a therapeutic partnership and is fundamental to good patient care.

Whether or not women's health will eventually become permanently established as a medical practice specialty remains to be seen. Regardless, it seems certain that substantial modifications in educational programs are necessary to respond to the evident gap in the treatment and care afforded women in our medical system. The health of women, like the health of men, will

...knowledge and teaching about general medical illnesses, based on research with male patients, may be deficient or even incorrect when applied to women patients.

remain the province of all doctors.

In addition, there has been a groundswell from consumers for specific treatment centers in the area of women's health. While this call for service is somewhat tangential to the discussion of curricula and training, it does demonstrate strong support for caregivers who are sensitive to the specific needs and problems of women. As

health care reform leads to the reorganization of medical practice, providers will need to be open to these new resources that promote patient education and responsibility.

Overall, from a number of perspectives, ranging from a more articulate patient group, increasing numbers of women in medicine, greater numbers of women in positions of power, new mandates from NIH and from advocacy groups, to heightened awareness of the role of gender differences in health care, there is a confluence of factors which support the need for expanding attention to women's health in curricula. With all of these influences, it is anticipated that issues of gender will be more overtly integrated throughout medical school offerings and that specialized programs will be developed to meet demonstrated needs.

An analogy has been made between the field of geriatrics and the needed structure for women's health care. Both fields work with specific patient populations and address areas that cross disciplinary boundaries.

The medical school curriculum is not a static entity. Rather, its structure, content and format are subject to continual review and update. One measure of the effectiveness of our teaching is the degree to which our students are adequately prepared to help the patients with whom they will work. An appreciation of the influence of gender on patient care is surely an essential element in the process of becoming a competent, caring physician.

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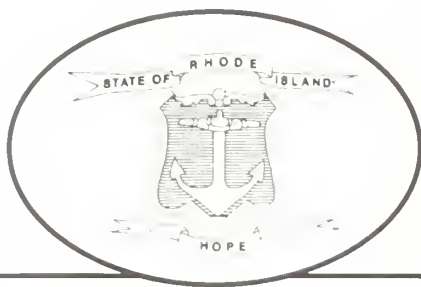
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Breast Cancer Rates Among Women Ages 30–49

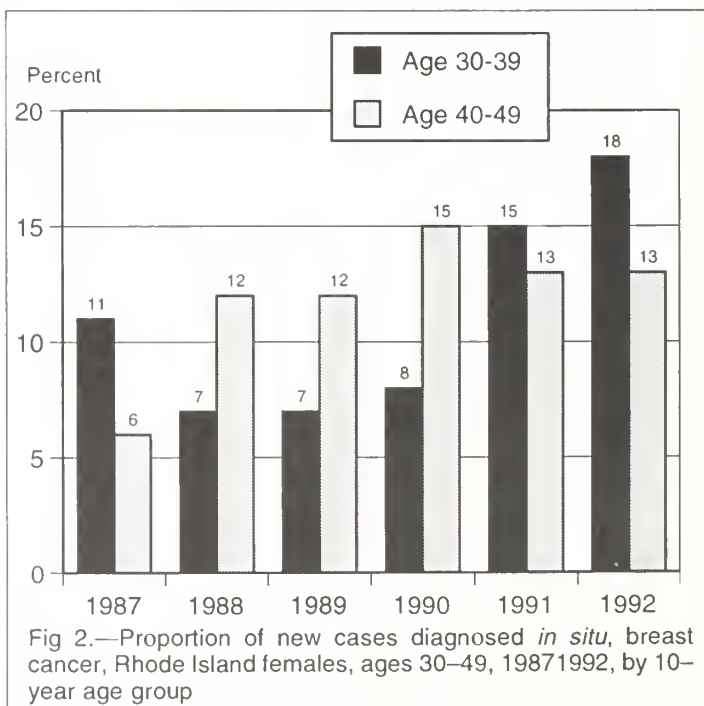
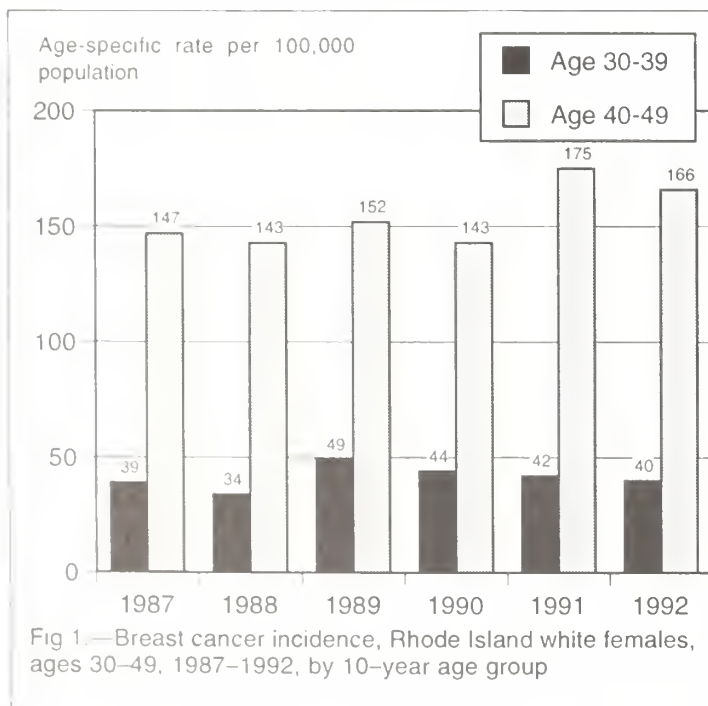
To investigate the widespread perception that breast cancer is increasing among younger Rhode Island women, the RI Department of Health analyzed cancer registry data and vital records data for the years 1987–1992, focussing on women ages 30–39 and 40–49. Age-specific breast cancer incidence and mortality rates were computed for white, female Rhode Islanders, using counts of newly diagnosed cases from the RI Cancer Registry and counts of deaths from the RI Office of Vital Records. *In situ* cancers were excluded in the computation of incidence rates, per convention. Denominators for the rates were interpolated from 1980 and 1990 US Census data for white, female Rhode Island residents. Rates were not computed for other groups of women, because the numbers of newly diagnosed breast cancers and breast cancer deaths are too small to compute stable annual rates.

Proportions of newly diagnosed cancers staged as *in situ* were computed from cancer registry data for women ages 30–39 and 40–49.

In Rhode Island, 1987–1992, the breast cancer incidence rate did not increase among women ages 30–39, but increased 17% among women ages 40–49 (comparing average rates for 1987–1990 with average rates for 1991–1992, Figure 1). In the same period the proportion of breast cancer cases diagnosed *in situ* increased among women ages 30–39 and women ages 40–49 (Figure 2), but the breast cancer mortality rate did not demonstrate a trend upward or downward for either group.

The widespread perception that breast cancer is increasing among younger Rhode Island women appears to have some basis in fact. Although incidence has not increased

among women ages 30–39, it has increased among women ages 40–49. This increase may be due in part to a related increase in breast cancer screening between 1987 and 1992, as evidenced by the increase in the proportion of breast cancers diagnosed *in situ*. Although *in situ* cancers are not used in computing incidence rates, they indicate the effective use of screening mammography, the method by which they are usually detected. Although screening all asymptomatic women ages 30–39 with mammography is not recommended (in part because of the very low incidence of breast cancer among these women), it may be useful in screening women determined by a provider to be at high risk for breast cancer, as demonstrated by the *in situ* cancers thus found. When detected *in situ*, breast cancers are almost always curable.



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Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Violence Against Women

Joann Lindenmayer, DVM, MPH, Judith P. Feldman, MD, MPH, and
Ann Thacher-Renshaw, MS

What's in a Name?

For years, violence against women (or *domestic violence*, or *family violence*) had no name. There was no acknowledgement of a shared problem, and it was reduced to millions of battles fought alone by women (and their children). With a name has come medical, legal, and social support for its victims. We now know that this type of violence is usually committed by men against women, two-thirds in the context of a current or former relationship, one-third not, that children are frequently involved (10% of the abused women are pregnant; another 10% have children also abused by the batterer), and that the violence is committed repeatedly. We have begun to see that the violence is not random, that there are patterns to it. We have begun to seek solutions to it and ways to prevent it.

A Chronic Disease

Violence against women bears strong resemblance to a chronic disease. As with a chronic disease, risk factors for men who batter women are numerous and interconnected: violent childhood, history of alcohol abuse, poor social and problem-solving skills, low self-image, employment and marital difficulties, and anti-social personality traits, to name a few. Similar to a chronic disease, violence against women is often a problem of lifelong standing. Men who abuse women usually have abused them before and will abuse them again;

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women who are victims may adopt the role of victim and be victimized again, at the hands of the same or another man.

Because it is chronic in nature, violence against women places great demands on the health care system. The victims likely encounter the health care system many times: as persons with apparent somatic illness or emotional problems, as frequent visitors to emergency rooms for frank injuries, and, tragically, as occupants of an autopsy table. The direct cost of treatment for repeated injuries may be large, but the costs associated with the long-term effect of violence on the health of women are enormous.

At a minimum, the response such violence demands is prompt medical attention to injuries, and removal of those in immediate danger of injury or death. But as with any chronic disease, we must also establish long-term therapy, in this case by referring abused women to agencies that offer long-term support. In short, we must intervene as quickly as possible, with appropriate follow-through, avoiding missed opportunities for intervention.

Rhode Island

Violence against women is not new to Rhode Island. It is a problem of the first order. In 1993 in Rhode Island, 24,000 women were treated in emergency departments for injury-related diagnoses; a third of these injuries were suspected of being inflicted by an intimate partner or family member. In the same year, violence abuse hot lines reported more than 14,000 calls, 9,000 abused women received support services, and 1,000 women and children were removed from dangerous environments and placed in emergency housing. In 1992 in Rhode Island, 4,800 victims were contacted and offered advocacy, almost 3,000 restraining orders were issued, and a third of these restraining orders were violated.

Although these figures themselves may

Successful prevention of violence against women involves both the timely separation of victim from abuser and long-term behavioral therapy for both.

be mind-boggling, they are probably gross underestimates of domestic violence in our state. By national estimates, 14% of adult women report that a husband or boyfriend has been violent with them. This translates to 57,700 women victims of abuse in Rhode Island, a number far higher than the number served by state support agencies.

A New Program

The Injury Prevention Program of the Rhode Island Department of Health was recently awarded a grant by the Centers for Disease Control and Prevention to improve the delivery of services to abused women. The Rhode Island Violence Against Women Prevention Program has three objectives: improved surveillance, improved identification of victims, and improved coordination of services to abuse victims.

The first objective is to develop and improve surveillance systems to monitor violence against women. The Health Department has morbidity and mortality data associated with violence against women, the Attorney General's office has information on restraining orders issued, arrests and convictions for violence, and the Rhode Island Coalition Against Violence has information on the use of nonmedical support services such as hotlines and shelters. We need to evaluate these data sources for their usefulness in tracking violence against women and, once a surveillance system has been established, begin to analyze its data to establish baseline measurements of violence against women.

The second objective is to improve identification of victims of abuse and ensure that once they are identified, they are referred to agencies that can serve them. To accomplish this, the program will provide technical assistance and support for a public education campaign to increase the public's awareness of violence against women, to encourage reporting of domestic violence

incidents, and to create an environment in which violence against women is not tolerated. The program will also provide technical assistance and support to training health care providers to identify better the victims of abuse, to develop protocols for treatment and referral, and to encourage and support legislative efforts to make Rhode Island safer for victims of domestic violence.

The third objective recognizes that support services are currently offered by a number of public and private agencies and at all levels of government, and that coordination among them is fragmented at best. Hence, to address this adequately, an inventory of available services must be taken and a coordinated plan must be formulated that is comprehensive and equally accessible to all women in need.

Programs that deal with violence against women are relatively new. As a consequence, there has been little opportunity to evaluate the success of their efforts. Nonetheless, two points are well established: successful prevention of violence against women involves both the timely separation of victim from abuser and long-term behavioral therapy for both. We cannot afford to wait to act, pending the outcome and evaluation of newly implemented programs. Violence against women is a problem of personal and public health. We must work together in our professional and personal lives to stop the violence.

Table 1.—Recommendations for Additional Information Useful to Health Care Providers

1. Department of Mental Health, American Medical Association: *Diagnostic and Treatment Guidelines on Domestic Violence*. Chicago: American Medical Association, 1992.

[“The booklet provides an overview of the problem, describes forms of abuse, and presents common clinical findings. In addition, it provides information and recommendations regarding the interviewing process, available interventions, barriers to identification, documentation, legal considerations such as reporting requirements, conducting risk management, and trends in treatment and prevention.” From reference 2, below.] Available from:

Jean Owens
Department of Mental Health
American Medical Association
515 North State Street
Chicago, IL 60610
(312) 464-5066

2. Education Development Center, Inc: *Domestic Violence: A Directory of Protocols for Health Care Providers*. Newton, Massachusetts: Children's Safety Network, 1993.

[Contains many useful references.]

Available from:
Beth Hume
Children's Safety Network
Education Development Center
55 Chapel Street
Newton, MA 02160
(617) 969-7100 PH
(617) 244-3436 FX

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (December 1904)

The results of improper treatment of some eye affections are vividly described by Dr G. W. van Benschoten. He begins by stating: "That we learn more from our mistakes than from our successes is an old saying and worthy of belief, as every medical man can testify." There follows then an analysis of some nine cases improperly treated (either by self-medication or through mistreatment by fellow physicians) before the author's intervention staved off further ocular disaster. The author treats the errors of his colleagues in a most courteous and solicitous fashion: "I have no idea that that physician has ever known the amount of suffering he inflicted, unintentionally of course, upon that little patient." The advocated therapies are generally prudent, limited by the available agents. For a deeply congested and inflamed eye, the following is recommended: "Atropine, hot bathing, application of leeches and mercurial inunctions finally secured the reduction of the inflammation in the eye . . ."

The minutes of the September 1904, meeting of the Rhode Island Medical Society are presented. Scientific papers describing "The Significance of Pus in the Nose", "The Relation of Dentistry to Medicine", "Injury to the Cervical Portion of the Spinal Cord", and "Injuries of the Eyeglobe" were presented and vigorously discussed. Upon completion of the scientific session, a dinner was served at Fields Point.

Various book reviews are presented. The surgical treatment of Bright's disease (ie, renal decapsulation) forms the basis of one text. The present record of the author's work and success, says the reviewer, will hasten the recognition and extend the usefulness of this most important operation. Another new medical text discusses the

pathology and therapy of disorders of nutrition, particularly obesity. Yet another new book is a treatise on the nonsurgical treatment of prostatic disease, particularly electrolysis and cataphoresis. The final review is of a textbook on mental depression (called "The Blues: Neurasthenia, Causes and Cure") which the author, a prominent San Francisco physician, attributes to "relaxed abdominal walls, intestinal gas accumulation and venous stasis below the diaphragm."

Charles V. Chapin, MD, Superintendent of Health, summarizes the health of the community in August and September of 1904. The death rate is down. The principal cause of death during these months is diarrheal disease, with 19 additional deaths from diphtheria and 8 from typhoid fever. Only one case of small pox during this interval, imported from North Adams, Mass.

50 Years Ago (December 1944)

Harry Messinger, MD describes the eye signs in 200 hundred diabetic patients in his office and clinic practice. The most frequent affections were retinal, including arteriosclerosis, hemorrhage and localized degeneration. The next most common were cataracts in 86 patients. There also were eight cases of eye muscle paralysis, nine cases of glaucoma and one of melanoma. The author states: "Diabetics have all the eye-troubles that others have and do less well with

Joseph Thimann, MD of Boston describes the conditioned reflex treatment of alcoholism. Based upon Pavlov's observations of acquired or conditioned reflexes in experimental animals, some have recommended that alcoholics be treated with a regime containing emetics to condition a reflex revulsion to alcohol intake. The author believes that this regime works well but lists

many precautionary steps.

Harry Seldin, DDS offers helpful hints in nitrous oxide-oxygen administration for dental surgery.

John F. Kenney, MD describes a case of staphylococcus bacteremia treated with sulphadiazine and penicillin.

Charles Kubik, MD discusses rupture of lumbar intervertebral disks.

25 Years Ago (December, 1969)

On the 100th anniversary of his birth, the *Journal* reprints Harvey Cushing's presidential address before the American College of Surgeons, Boston, 1922. It is entitled *The Physician and the Surgeon* and emphasizes the belief that the complete physician must be familiar with both departments.

Howard Sturim, MD presents the case of a seven year old girl who suffered partial amputation of her right nostril as the result of a dog bite. Through the use of a composite earlobe graft, an excellent cosmetic result was achieved.

Helen De Jong, for many decades the librarian of the Society, writes on the prized possessions in the historical archives housed in the Francis St building. Her essay ends with this observation: "It is a feeling of presence, of knowing that these books were created by men who lived, loved, argued, were happy, were sad, were dedicated and worked hard, and who are living today in the works they have left for us. It is the sensation you have when you stand in the anatomical theatre in Padua with your hands on the smooth railing, or when you wander through the old streets of Edinburgh."

Guy A. Settipane, MD provides a comprehensive progress note on systemic lupus erythematosus as a model for the study of immunological disease.

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